The New England
Journal of Medicine

VOLUME 203 DECEMBER 25, 1930 NUMBER 26

BLOOD CHOLESTEROL VALUES IN HYPERTHYROIDISM AND HYPOTHYROIDISM—THEIR SIGNIFICANCE*

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THE influence of the endocrine glands upon fat metabolism has been the subject of considerable study during the past three decades. Magnus-Levy[1] in 1895 made one of the most important contributions to this subject by his observations upon the influence of the thyroid on metabolism. Through his work the conditions of endogenous adiposity came to be recognized. Von Noorden[2] and Umber[3] conceded to the thyroid a central place in the genesis of fatty diseases. In all cases of myxedema and in many cases of endogenous adiposity thyroid insufficiency was noted.

Emaciation (rapid loss of weight) has been one of the outstanding chief characteristics of thyroid hyperactivity. The mobilization of fatty substances occurs through the blood stream and study has been directed by many investigators to the blood as a vehicle for lipoid substances. Unfortunately, one does not find close agreement of conclusions from these investigations.

That thyroxin has a definite positive effect on lowering the blood cholesterol has been reported by Parhon and Dérévici[4], who found that hyperthyroid dogs had cholesterol values lower than normal dogs. In animals deprived of the thyroid gland, on the other hand, the cholesterol was much higher than normal but became markedly decreased when thyroid was fed. Leupold and Seisser[5] observed that the feeding of thyroid or thyroid injections in small amounts caused a reduction of cholesterol in the blood. Goldzieher and Hirschhorn[6] found that thyroid residue administered to animals at the same time as cholesterol emulsion was injected intraperitoneally prevented the normal storage of cholesterol in the Kupfer cells of the liver.

Animal experiments made by Parhon and Dérévici[4], and by Blinoff[7], indicate that hyperthyroid dogs have blood cholesterol values lower than the values of normal dogs, whereas the cholesterol values of animals deprived of their thyroids were markedly increased over the values found before thyroidectomy. On the other hand, Rémond, Colombiès and Bernardbeig[8] found that thyroidectomy produced no effect on the cholesterolemia of rabbits. Heckscher[9] discovered that removal of the thyroid gland from a healthy horse produces an increase in blood cholesterol. Onizawa[10] found cholesterol in the plasma of the thyroid depleted animal to be increased. Similar results have been obtained in a study of patients. Bing and Heckscher[11], Epstein and Lande[12], Nicholls and Perlzweig[13], C. J. and M. Parhon[14] have found diminished values of cholesterol in patients with exophthalmic goitre. Improvement in conditions due either to medical or surgical treatment has resulted in every case in a rise in the blood cholesterol to the normal levels. These same authors have found a marked increase in blood cholesterol in cases of thyroid insufficiency.

Epstein and Lande[12], Werner[15], Colombiès, Shapiro[16], conclude that a definite inverse relationship exists between the cholesterol value and the basal metabolic rate. Gextman[17] is of the opinion that this is true only in extreme cases. The very sick hyperthyroid patient has a markedly lowered blood cholesterol. However, in the next most serious cases the cholesterol values are well within the normal range. Only in the very severe cases could any direct correlation between basal metabolism and blood cholesterol be found. Similarly, Laroche[18] finds that the patients most seriously affected by the process of denutrition connected with hyperthyroidism have cholesterol values lower than normal, and he considers this sign an index of the gravity of the disease.

On the other hand, findings contradictory to the above have been made. Luden[19] found all the blood cholesterols in 35 cases of exophthalmic goitre to be within the normal range even when the basal metabolic rate was 100% above normal. Wade[20] reports slightly increased values of blood cholesterol in toxic cases before operation. Castex and Schteingart[21] determined that no relation exists between the basal metabolic rate and the blood cholesterol value. They conclude that any hypo- or hypercholesteremia observed in patients with thyroid difficulties does not depend upon these, but on concomitant causes. Gardner and Gainsborough[22] likewise agree that their cases of hyperthyroidism do not provide any support for the theory that the blood cholesterol is inversely proportional to the basal metabolic rate, although they do find increased values of blood cholesterol in untreated hypothyroid cases. Denis[23] states that the plasma cholesterol in severe hyperthyroidism is within, or just below, the lower normal limit. Rothschild[24] and Jacobsohn found an increase of

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20 per cent. above normal values of cholesterol in thyrotoxic conditions experimentally produced.

It is well recognized that the basal metabolic rate does not always give the true picture of the condition of the patient. Clinical impressions are difficult to define. With an idea toward securing a laboratory test which would give a further check on the clinical impression of the severity of hypothyroidism or hyperthyroidism we have studied a group of 47 patients with hyperthyroidism and another group of 23 patients with positive hypothyroidism.

The patients from whose blood the determinations were made were unselected except where concomitant conditions were present which might have a disturbing effect on the cholesterol metabolism, such as diabetes, nephritis, pregnancy or high fever.

The blood was taken in a fasting condition and analysis was made on the plasma by the method of Bloor, Pelkan and Allen[28], and close agreement of results was obtained. The values recorded are those in which duplicate analyses have shown an agreement within 5%.

The blood cholesterol values in the cases of hyperthyroidism are shown in Table I. In Table II are shown the findings in both hyperthyroidism and hypothyroidism. That there is, in a general way, a hypocholesteraemia accompanying an elevated basal metabolic rate and conversely a hypercholesteraemia with a lowered rate is shown in Table II. Here the blood cholesterol values are plotted against the basal metabolism levels.

Age	Sex	Duration	Weight in Lbs.	B.M.R.	Cholesterol mgs. 100 c.c.
24	M	7 yrs.	125	+138	71
27	F	3 yrs.		+107	94
29	M	7 mos.	118	+101	121
33	F	6 mos.	116	+100	140
45	F	6 mos.	137	+92	142
32	F	11 mos.	160	+87	123
55	M	8 yrs.	123	+80	127
48	F	1 yr.		+79	149
41	F	1 yr.	90	+78	115
60	F	6 mos.	110	+75	150
39	M	3 yrs.		+75	150
50	M	3 yrs.	94	+72	132
26	F	1 yr.	124	+71	131
25	F	2 mos.	131	+69	151
66	F	10 yrs.	78	+68	175
20	M	6 mos.	120	+65	153
43	F	9 mos.	106	+63	96
38	F		100	+60	137
21	F	1 yr.	115	+60	129
40	F		116	+60	140
47	F	6 mos.	91	+60	107
56	F	30 yrs.	157	+58	97
31	F	7 yrs.	100	+57	111
27	M	6 yrs.	106	+54	93
41	M	1 yr.		+53	144
59	F	12 yrs.	103	+51	85
47	M	18 mos.	145	+50	182
22	F	9 mos.	160	+50	132
28	F	15 mos.	165	+49	182
50	F	12 yrs.	106	+48	139
56	F	10 yrs.	99	+47	106
27	F	2 mos.	140	+44	139
27	F	5 mos.	87	+42	130
46	F	5 yrs.	106	+38	138
64	F	1 yr.	86	+37	150
46	F	4 yrs.	85	+36	106
12	F	1 yr.	82	+36	130
52	F	2 yrs.	142	+36	173
48	M	9 mos.	149	+30	88
47	F		88	+30	169
31	F	7 yrs.	69	+29	110
20	M	6 mos.	88	+27	68
30	F	9 mos.	110	+23	183
53	F	15 yrs.	138	+22	162
58	M	6 mos.	138	+21	84
47	F		163	+13	163
31	M	8 mos.	93	+10	130

TABLE I.
Basal metabolic rates and blood cholesterol levels in 47 cases of hyperthyroidism.

In the 47 cases of proved hyperthyroidism the blood cholesterol values range from 71 mg. per 100 c.c. to 183 mg. The average of the basal metabolic rates in the 47 cases was plus 57%; the average cholesterol level, 130 mg. per 100 c.c. In the 23 cases of myxedema, on the contrary, the values range from 218 to 500 mg. The average of the basal metabolic rates in the 23 cases of myxedema was minus 30%; the average cholesterol level 321 mg. per 100 c.c. In earlier papers[29] from this laboratory the maximum normal cholesterol level has been accepted as 230 mg. per 100 c.c. It will be seen that the

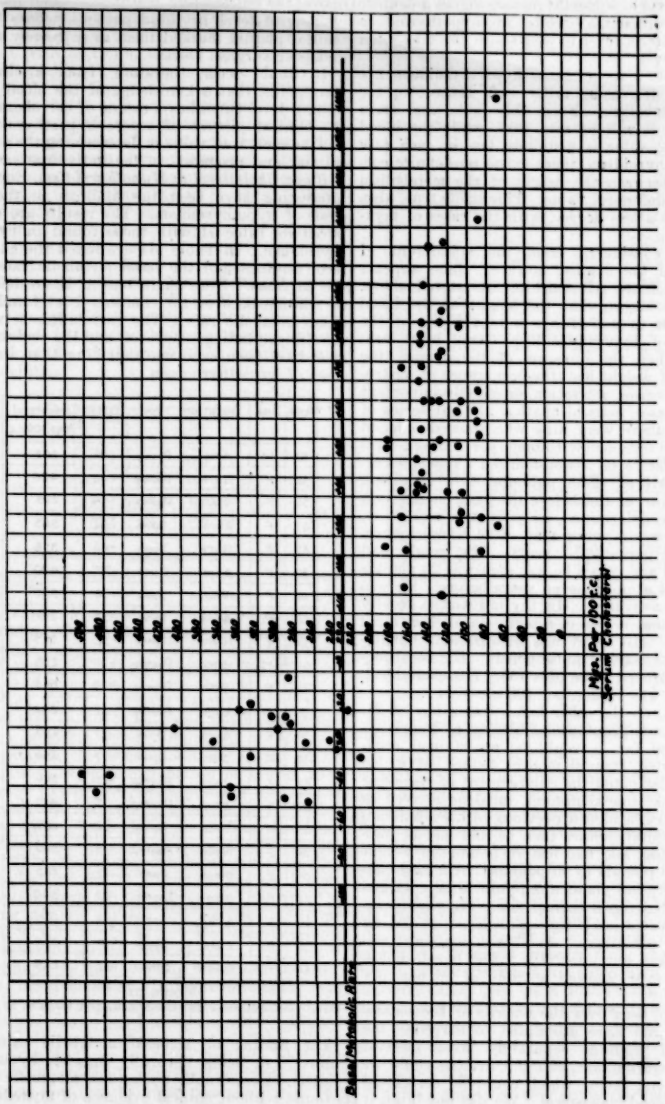

TABLE II.

Blood cholesterol values in hyperthyroidism and in hypothyroidism plotted against basal metabolic rates.

average case of hyperthyroidism shows a definite hypocholesteraemia, while in hypothyroidism the cholesterol level is well above the maximum normal level.

In Table I the cases of hyperthyroidism are listed in decreasing order with respect to the basal metabolism. From this table, and from Table II, it will be seen that, while the blood cholesterol value is definitely low in each case of hyperthyroidism, there exists no definite correlation between the height of the metabolism and the cholesterol value. This holds true, also, though to a less degree, with the cases of myxedema.

When considered from the standpoint of gravity of the disease, however, there appears a more definite relationship. As stated above, it is well known that the height of the basal metabolism is not always a true index of the severity of hyperthyroidism. One must consider, rather, the duration of the disease, the amount of weight lost, the occurrence of gastrointestinal crises, activation, or equally important in some cases, marked apathy. In our series of 47 cases, there were nine who showed a blood cholesterol level below 100 mg. per 100 c.c. This we consider to be a well-marked hypocholesteraemia. All of these patients were classified, when first seen, and before the basal metabolism rates were determined, as extremely sick cases.

Case 1 was a young man of 24 whose history covered a period of 7 years. His weight had fluctuated and, when he was seen was 20 pounds below that at onset seven years before. He was markedly activated. His thyroid was so greatly enlarged that it was in a plane parallel with his mandible. His heart was in auricular fibrillation with a marked pulse deficit. His basal metabolism proved to be plus 138. His cholesterol, as shown, was 71 mg. per 100 c.c.

Case 21, on the other hand, was a boy of 21, a Polish immigrant whose history of hyperthyroidism, so far as could be ascertained accurately, dated from 6 months before, at which time he first noted the enlargement of the neck. He had had few symptoms, until he arrived in this country, a month previous to his admission to the hospital. Since then he had had persistent vomiting, and had lost 70 pounds in weight (from 160 pounds to 90 pounds). On examination the thyroid gland was found to be enlarged to about ten times normal size. He was markedly activated and was considered to be an extremely toxic case. As shown, his basal metabolism was but plus 27%. The blood cholesterol, however, showed a value of 68 mg. per 100 c.c.

We have been over the records of these cases carefully and have attempted to correlate the cholesterol findings separately with loss of weight, duration, age, etc., but in none could we find any one factor which could be correlated with the blood cholesterol. We did not think it necessary to further encumber this paper with the data derived from this study. As noted above, the outstanding feature has been the low cholesterol level in those patients whose total clinical picture marked them as extremely toxic and poor surgical risks.

It would seem, therefore, from a clinical standpoint, that a knowledge of the blood cholesterol level furnishes a means of corroborating the clinical picture of severe hyperthyroidism and, as such, is of value in determining the surgical risk and prognosis in the individual case.

Blood Cholesterol in Hypothyroidism. Equally interesting have been the findings in the 23 cases of hypothyroidism. The results are compared in Table II with those found in hyperthyroidism. In Table III are listed the cholesterol findings and the basal metabolic rates of the 23 cases. Here again one finds no definite correlation between the cholesterol level and the basal metabolic rate. The correlation between the clinical findings, however, and the cholesterol level have been even more striking than in the cases of hyperthyroidism.

Age	Sex	Duration	Type	B.M.R.	Cholesterol
					mgs. 100 c.c.
42	M	4 mo.	Postop.	-46	268
52	F	3 yrs.	Postop.	-46	490
36	F	9 mos.	Postop.	-44	295
41	F	2 yrs.	Spon.	-42	345
25	F	12 yrs.	Spon.	-40	356
47	F	3 yrs.	Spon.	-37	479
46	F	unknown	Spon.	-36	300
23	M	4 yrs.	Spon.	-33	217
59	F	10 yrs.	Spon	-32	325
67	M	15 mo.	Postop.	-30	233
42	F	9 mo.	Postop	-28	365
37	M	6 mo.	Postop	-27	242
36	F	8 yrs.	Spon.	-27	233
38	F	3 mo.	Spon	-27	266
42	F	2 yrs.	Postop.	-25	300
52	F	5 mos.	Postop.	-25	410
59	F	3 yrs.	Spon.	-24	289
34	F	15 mos.	Postop.	-23	305
34	F	8 mos.	Spon.	-22	295
28	F	3 mos.	Postop.	-20	340
59	F	6 mos.	Spon.	-20	225
35	F	2 yrs.	Spon.	-19	329
40	M	10 yrs.	Spon.	-12	289

TABLE III.

Basal metabolic rates and blood cholesterol levels in 23 cases of hypothyroidism.

The finding of a basal metabolic rate of minus 20 or below naturally suggests hypothyroidism. Occasionally such a low metabolic rate is found without clinical evidence of myxedema, or without any other signs or symptoms suggesting diminishing thyroid function. In fact, we have

seen such basal metabolic rates in young, active individuals with no complaints or clinical signs. When such a low test is found, however, in a patient with asthenia, fatigue or other subjective symptoms, on the one hand, or obesity, on the other, the diagnosis of hypothyroidism is apt to be made. In our experience, patients with low metabolic rates without fairly clear-cut signs or symptoms of myxedema receive little or no benefit from thyroid therapy. It might be well to say here that by myxedema we do not mean that the patient has to be obese. Many patients display dry skin, brittle finger nails, dryness of the hair, a complaint of coldness, lethargy, retarded mental activity or even mental disorders without appearing as typical myxedematous patients. Nevertheless, these patients have myxedema. While they are not so easily recognized clinically on their gross appearance, yet they can be easily diagnosed by a minute study of their physical condition and complaints.

Age	Sex	B.M.R.	Cholesterol
50	F	-23	208
50	F	-30	204
29	F	-21	117
27	F	-28	146

TABLE IV.

Four cases with low basal metabolic rates but without clinical myxedema.

In Table IV are shown the blood cholesterol determinations in four patients who showed, clinically, no evidence of myxedema, but whose basal metabolic rate was minus 20 or below. They had been treated with thyroid extract, at previous periods, without results. It is to be noted that in all these cases the blood cholesterol was within normal limits. If we compare, for instance, the blood cholesterol in any of the patients showing a metabolism of minus 20%, or lower (Table IV), with patients who showed clear-cut myxedema with a metabolic rate below minus 20% (Table III) we see that the blood cholesterol shows much higher value in the latter. This relationship can be shown in another way. Patient No. 23 on the list showed a blood cholesterol level of 289 mgms. per 100 c.c. after having stopped thyroid for one week. His metabolism was minus 12%. He later developed well-marked clinical myxedema.

Perhaps the most striking feature of the study of the blood cholesterol in myxedema is the manner in which the high cholesterol level returns to normal as the basal metabolic rate returns to normal following treatment. In Table V are listed the findings in eleven patients who were followed for periods varying from four months to thirty-two months after treatment with thyroxin or desiccated thyroid. These eleven cases showed an average basal metabolic rate, at the beginning of the study, of minus 33%. After an average of sixteen months' treatment, the rate had risen to minus 2%. The blood cholesterol at the beginning averaged 336 mg. per 100 c.c., while after the sixteen months of treatment, averaged 171.

Age	Duration	B.M.R.	Cholesterol	Date
25 F	12 yrs. Spon.	-40	356	12-12-27
		-1	183	4-16-29
42	9 mos. Post. Op.	-28	365	9-30-27
		-11	265	3-27-28
		+ 5	210	3-31-30
41	2 yrs. Spon	-42	345	1-6-28
		+ 1	191	3-27-30
38	3 mos Post Op.	-27	266	4-20-28
		-10	185	2-20-29
42	4 mos. Post Op.	-46	268	8-4-28
		- 6	161	4-9-30
46	Unknown	-36	300	4-2-27
	Spon.	+ 1	165	10-26-27
			165	3-14-29
23	?	-33	217	8-14-28
	Spon.	-15	133	3-12-29
33 F	2 yrs. Post Op.	-19	329	11-12-29
		+ 8	167	3-12-30
28 F	3 mos. Post Op.	-20	340	7-28-27
		-10	132	3-29-30
67 M	15 mos. Post Op.	-30	233	8-14-28
			208	4-21-30
47 F	? Spon	-37	479	2-11-29
		+15	117	3-2-29
		- 3	184	9-30-29

TABLE V.

Eleven cases of myxedema showing response to treatment and coincident fall in blood cholesterol level.

In studying the individual records, it will be seen that as the basal metabolic rate returns to normal values, and with clinical improvement, the blood cholesterol levels also return to normal. This represents the only definite correlation between basal metabolic rates and blood cholesterol values in this study. As shown in Table III, however, in cases of untreated myxedema, with a metabolic rate which is not particularly low, a high cholesterol may be found.* In these cases the clinical evidences of myxedema have been striking. It would appear, then, that the severity of the disease is indicated by a high cholesterol value, just as a low cholesterol value indicates severe hyperthyroidism. It seems more likely, however, in hypothyroidism that the blood cholesterol level reflects the patient's true condition more accurately than does the basal metabolic rate.

At the outset of this study we felt that, in

*All basal metabolic rates were determined after a night spent in the hospital.

order to be certain of the relationship of the blood cholesterol to true myxedema and to low basal metabolic rates without myxedema, we would have to choose patients with very low rates (minus 20 or more), who appeared to be normal otherwise. Naturally, we were not able to find a great number of such patients. The four whom we felt should be placed in this category are listed in Table IV. From our data and observation we feel that it is quite likely that myxedema or hypothyroidism does not exist in a patient with a low basal metabolic rate and a normal blood cholesterol. This, of course, is in the absence of other diseases giving rise to an elevated blood cholesterol.

COMMENT

Aside from the statistical data presented, this study has, to the authors at least, suggested a variety of speculations with regard to the nature of thyroid dysfunction and its effect upon the organism as a whole. Chief among these are the effects of the long-continued hypocholesteremia or hypercholesteremia upon patients with hyperthyroidism or hypothyroidism. From the work of Aub and his collaborators[27] we know that calcium excretion in patients with hyperthyroidism is markedly increased, often as much as 231% of normal. In hypothyroidism, on the other hand, the calcium excretion is markedly reduced; the average excretion of the six patients reported by Aub was 40% below the normal average level. If arteriosclerosis is associated with an abnormal cholesterol retention together with a decreased output of calcium, then one would expect a high incidence of arteriosclerosis in the myxedema patient. In diabetes, in which the blood cholesterol is not infrequently elevated and the calcium is low, the high incidence of arteriosclerosis is well known. In the patient with hyperthyroidism, by the same token, one would expect a lowered incidence of arteriosclerosis, since the cholesterol is low and the calcium excretion high. Of course, it would not be probable that preëxisting atheromata would be affected by the onset of hyperthyroidism.

The formation of gall stones has long been thought to be associated in some way with disordered cholesterol metabolism and the high incidence of gall stones in diabetes seems to bear this out. Should patients with myxedema have a higher incidence of gall stones than the normal individual? These are subjects which deserve further study.

SUMMARY

1. Cholesterol values on 70 patients with thyroid disturbances are reported.

2. Hyperthyroid conditions tend to diminish the level of the cholesterol in the blood. The lowest values are found in extremely toxic patients. There is, however, no definite correlation between the cholesterol value and the basal metabolic rate.

3. True myxedema is accompanied by a markedly elevated blood cholesterol. Low metabolic rates, however, without clinical evidence of myxedema are accompanied by normal cholesterol values.

4. Cholesterol values are a definite help in estimating the gravity of hyperthyroidism.

5. Cholesterol values are important aids in diagnosis and prognosis and in estimation of response to treatment in patients with hypothyroidism.

6. Possible coincident effects of disordered cholesterol metabolism are suggested.

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DURATION OF BREAST FEEDING: A COMPARATIVE STUDY

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THE statement has been made by various enthusiasts on the science—or art—of breast feeding, that ninety-nine per cent. of modern mothers can and should nurse their infants. Those of us who have tried and failed to attain this happy millennium of infant culture must stand abashed before the masters. We have not in our possession the touchstone which can produce such a result. It may be that ineradicable sectional differences obtain; that the supposed intellectual culture of Boston and its vicinity exercises a deleterious effect on the merely physiologic process of lactation, or that local pediatrists have not the wit or the ambition to employ to their logical conclusion the methods which have been used with such success elsewhere.

The fact remains that, despite the willingness of the patient and the coöperation of the physician, the number of mothers who seem physically able to nourish their infants falls far short of the ideal ninety-nine per cent., and, considering the efforts which are sometimes necessary to accomplish the physical fact of satisfactory milk production, the belief may be harbored that the number who should nurse may, under the circumstances, be even less than the number who are theoretically capable of it.

It would be heresy on the part of any conscientious pediatrician to cast doubts on the desirability of a mother's nursing her infant, and it is not our present policy to indulge in heresy. It seems, however, as if a safe middle course might be charted somewhere between the positions of those devoted enthusiasts who believe that practically every mother can and must be inspired to nurse regardless of the cost, and those complacent advisors who seek only to serve the whims of the patient, or who find it easier to prescribe a formula than to instruct in the method and exhort on the advisability of maternal feeding.

We must, of course, accept the possibility that nothing is impossible. Napoleon himself admitted it. The Lord's Prayer, for example, has been written on the head of a pin, but a practical mind might entertain some question as to whether the writer's time could not have been more profitably spent. With the question of nursing, consequently, desirable as we know it to be, it is not difficult to imagine circumstances under which, although possible, it may not be entirely practical.

Modern conditions of life are not conducive to that placid existence which serves best the interests of the nursing mother. The duties and responsibilities of the matron of today are more complex than were those of her grandmother, and she is living farther from nature. In an artificial environment the difficulties of succeeding in a function which is essentially natural are greatly enhanced. We encounter in increasing numbers mothers who are temperamentally incapable of nursing their young for any material length of time, and in still greater numbers those who seem physically incapable of it even after a conscientious effort has been made.

There may be an heredity factor involved in this incapacity, for as the technique of formula feeding has become more universally successful, a race which is less capable of successful nursing is being established. Modern practices are frustrating the law of the survival of the fittest, and, as is usual with civilized people, the evils of an artificial environment are being combated by artificial means.

It must, moreover, be generally acknowledged that bottle feeding no longer entails the dangers which were formerly associated with it, for in the vast majority of cases, if it is properly carried out, its success so closely approximates that of maternal nursing that their results are practically indistinguishable. This does not constitute an argument for the easy weaning, by complacent advisors, of infants whose mothers are capable of nursing them. The finer shades of the argument are always in favor of human milk, and at times it is indispensable to the infant, even as the act of nursing should weld a bond between mother and child which would be a source of permanent gratification to her. The mother who refuses to nurse her infant when she is capable of it is probably injuring herself more than she is the child if only by her failure to establish the proper relationship between them.

Actually, the social status, the intelligence and the environment of the mother are more important factors in assuring the health and well-being of the child than is the type of feeding. The truth is that we adhere too much to slogans instead of cutting the cloth to suit the garment. With older children we have been brought to the belief that a quart of milk a day is an essential to life, liberty and the pursuit of happiness, just as we have been taught to believe that the mortality among bottle-fed infants is seven times that among breast-fed infants, which is misleading by being a half truth, applicable only in those groups of society where the success of bottle feeding would be jeopardized by ignorance and lack of intelligence. With fewer well-meaning slogans and the exercise of greater individual judgment, the needs of the infant population would be better served, leaving it to the conscientious physician, knowing both mother and infant, to decide when weaning had best be accomplished.

Glazier[1], by his careful analysis of two clinic

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PRIVATE CASES

Duration of Nursing	No. of Pts.	3 hrly, 1 wk. or less with 3 hrly.	3 hrly 1 wk.-1 mo.	3 hrly 1-2 mo.	3 hrly 2-3 mo.	3 hrly 3-4 mo.	3 hrly. 4-5 mo.	3 hrly. 5-6 mo.	3 hrly 6-8 mo.	3 hrly over 8 mo.	4 hrly from start	Irreg.	Comp. or Supp. Formula	Reasons for weaning	Special efforts to continue nursing	Remarks
Less than 1 week	22 11%	22 11%												14- Insufficient milk 4- Mother ill 2- Sore nipples 2- Breast abscess		1- Caesarean - no milk 1- Mother had diabetes.
One week to 1 month	30 15%	4 2%	26 13%										14 7%	20- Insufficient milk 4- Sore nipples 4- Breast infection 1- Mother ill 1- Infant adopted	4- Used breast pump.	1- Infant adopted
One month to 2 months	33 16½%	4 2%	10 5%	9 4½%							10 5%		22 11½%	28- Insufficient milk 1- No reason given. 1- Infant hypertonic 1- Infant had colic. 1- Breast abscess 1- Sore nipples	1- Used breast pump 1- Stripped unsuccessfully	1- Hypertonic infant 1- Premature infant
Two months to 3 months	16 8%	2 1%	4 2%	1 ½%	4 2%						5 2½%		12 6%	14- Insufficient milk 1- Mother losing weight. 1- No reason given.	1- Used breast pump	
Three months to 4 months	20 10%	1 ½%	4 2%	2 1%	4 2%						9 4½%			17- Insufficient milk 1- Mother had cold. 1- Mother tired 1- Breast infection		1- Hem. disease, hypertonic infant; mother had pyelitis.
Four months to 5 months	25 12½%	2 1%	5 2½%	2 1%	2 1%		2 1%				12 6%		18 9%	22- Insufficient milk 1- Mother had mumps. 1- Mother had mastitis. 1- No reason given.	1- Used breast pump	
Five months to 6 months	23 11½%		6 3%	3 1½%		3 1½%					11 5½%		16 8%	22- Insufficient milk 1- Mother tired	5- Used breast pump 1- Stripped	
Six months to 8 months	20 10%	1 ½%	2 1%	3 1½%	1 ½%	1 ½%	1 ½%		2 1%		9 4½%		12 6%	10- Insufficient milk 1- Age of infant		1- Premature infant 1- Infant allergic to cow's milk; desensitized
Over 8 months	11 5½%	1 ½%	2 1%	1 ½%	1 ½%				1 ½%		5 2½%		6 3%	10- Insufficient milk 1- Age of infant		1- Sensitive to cow's milk
Total	200	37 18½%	59 29½%	21 10½%	12 6%	4 2%	3 1½%		3 1½%		61 30½%		101 50½%			

CLINIC CASES

Duration of Nursing	No. of Pts.	2 hrly. 1 wk. or less foll. by 4 hrly.	2 hrly. 1 wk.-1 wk.	2 hrly. 1-2 mo.	2 hrly. 2-3 mo.	2 hrly. 3-4 mo.	2 hrly. 4-5 mo.	2 hrly. 5-6 mo.	2 hrly. 6-8 mo.	2 hrly. 8 mo.- over	4 hrly. from start	Irreg.	Comp. or Supp. Formula	Reasons for weaning	Special efforts to continue nursing	Remarks
Less than 1 week	16 8%	16 8%												7- Insufficient milk 4- Breast infection 3- Mother ill 2- Nipples deformed 1- Sent to hospital for operation 1- No reason given		3- Mother had breast abscess with first baby 1- Mother had diabetes 1- Mother had t.b. 1- Infant had hernia 1- Infant premature
One week to 1 month	32 16%	(1-10 days 2 hrly.) 2%	26 13%								6 3%		1 ½%	19- Insufficient milk 5- Mother ill 3- Breast abscess 3- Milk didn't agree 1- Infant ill 1- Mastitis	4- Forced fluids	1- Mother had rheumatic fever with heart complications.
One month to 2 months	18 9%			16 8%								2 1%	4 2%	10- Insufficient milk 5- Mother ill 2- Infant ill 1- Breast abscess 1- Inverted nipples 1- Breast bruised by fall	2- Forced fluids	
Two months to 3 months	18 9%			2 1%	8 4%						4 2%	1 ½%	4 2%	10- Insufficient milk 3- Mother ill 1- Infant refused breast. 1- Infant losing weight 1- Mother didn't wish to nurse	4- Forced fluids	1- Milk disappeared with menstruation 1- Mother went to work
Three months to 4 months	12 6%				4 2%	6 3%					3 1½%		2 1%	8- Insufficient milk 2- Mother "run down" 2- Refused breast 1- Infant had eczema 1- Infant to be operated on 1- Infant "old enough"	1- Forced fluids	
Four months to 5 months	2 1%						1 ½%				1 ½%		1 ½%	2- Insufficient milk	2- Forced fluids	
Five months to 6 months	9 4½%			2 1%	2 1%	1 ½%		1 ½%			3 1½%		0 0%	4- Insufficient milk 2- Refused breast 1- Infant "old enough" 1- Mother "run down" 1- Vomited breast milk		1- Mother lost 16 lbs. trying to nurse baby 1- Baby vomited B.M. and formula
Six months to 8 months	29 14½%				5 2½%	1 ½%	7 3½%	1 ½%	9 4½%		4 2%	4 2%	11 5½%	7- Insufficient milk 4- Infant "old enough" 2- Mother "not strong enough" 2- Child not gaining 2- Mother pregnant	7- Forced fluids	12- Still nursing
8 months to 1 year	36 18%		1 ½%		7 3½%		2 1%	3 1½%	4 2%	10 5%	4 2%	8 4%	10 5%	16- Infant "old enough" 7- Insufficient milk 3- Mother pregnant 2- Mother not well	1- Forced fluids	6- Still nursing
One year and over	29 14½%				2 1%		2 1%	2 1%	1 ½%	11 5½%	2 1%	8 4%	8 4%	17- Infant "old enough" 2- Infant in hospital 1- Mother pregnant 1- Mother losing weight		6- Still nursing
Total	200	18 9%	26 13%	20 10%	28 14%	7 3½%	12 6%	7 3½%	14 7%	21 10½%	27 13½%	21 10½%	6% 23½%			

groups, has demonstrated that intelligence and environment have a more important bearing on infant health than has the type of feeding alone, for in his better-class Roslindale district the average bottle-fed infant did as well as the average breast-fed infant, whereas in the poorer-class North End district the frequency of infections, deficiency diseases and a greater infant mortality were irrespective of breast or bottle feeding. Actually, the frequency of infection and mortality was most common among the bottle-fed group in the poorer district clinic, and least common among the bottle-fed group in the better district clinic; an argument in favor of the breast among the poorer social groups, which does not obtain among the better social groups.

If any set rule should be established, it might be this: that every mother, *other things being equal*, should be encouraged to nurse her infant for a reasonable length of time, having had explained to her the desirability of nursing both for the sake of the infant and for her own sake; that she should be instructed in the technique of increasing and continuing her supply of milk, and that the duration of nursing or the attempt at it should be left to the discretion of the individual physician. Nursing, even for a short period, should be considered as better than not nursing at all, recognizing that the value of human milk is greatest in the early weeks and months and that greater maternal coöperation may be gained for a relatively short nursing period than by forcing an unconvinced mother to start with the idea that her term of service must be long and confining. Two groups of two hundred unselected cases each have been studied in order to ascertain the average duration of breast feeding in different types of patients, and, so far as possible, the nursing schedule which seemed to be most successful in promoting nursing. The first group consists of private cases, taken alphabetically, eliminating those where complete data were unavailable; the second group was taken chronologically from the Out Patient Department Clinic of the Massachusetts General Hospital. Practically all cases are, at the date of writing, still under six years of age, and practically all fall into three groups so far as the nursing schedule was concerned; those who nursed at three-hourly intervals for a longer or shorter period of time, followed by the four-hourly schedule; those who nursed continually from the start on the four-hourly schedule, and those who nursed at irregular intervals. The majority of those who employed the three-hourly schedule during the day time nursed only at four-hourly intervals during the night, abandoning the midnight feeding after two to four weeks; no recognition has been taken of the rare premature infant who might have started for a short period on a two-hourly schedule. It was found to be impossible to gather reliable information concerning the duration of individual nursings, or as to whether both breasts were given at a feeding. In general it may be assumed that both breasts were used at each feeding on the four-hourly schedule.

The breast feeding enthusiasts will be dissatisfied with the major reason given for weaning, which will be seen to be an insufficient amount of milk in both groups, and with the special efforts made to continue nursing. In our experience the electric and water pumps, while effective, were rarely tolerated for any great period of time and the technique of manual stripping, while successfully mastered by a few mothers, was firmly rejected by the majority of those by whom it was attempted, and was not further insisted upon.

Breast feeding was, in general, less successful and earlier terminated in the private case group, despite the fact, perhaps of doubtful value, that these mothers enjoyed pediatric oversight. In this group only fifty-four, or twenty-seven per-cent., of the mothers nursed beyond an arbitrary period of five months, as compared with one hundred and three, or fifty-one and one-half per cent., of the clinic mothers. In the latter group twenty-nine mothers continued nursing for over a year. Nearly the same number in each group made a practical failure of nursing, discontinuing the effort after a month or less—fifty-two in the private case group and fifty in the clinic group.

The results as regards nursing schedules can hardly be termed conclusive, since successful nursing periods of five months or over can be found on each of the three schedules. The evidence would seem to be in favor of the four-hourly schedule in the private case group, since in this group thirty-seven of the fifty-four cases were on four-hourly nursings from the beginning, or after a period of three-hourly nursings of a month or less. In the clinic group only fourteen out of one hundred and three cases were on an equivalent four-hourly schedule, and of the balance who nursed successfully, eighteen made no pretense to any regularity.

The distinct impression gained is that success in nursing depends more upon the ability and the desire of the mother than upon any arbitrary factor such as a defined schedule of nursing hours. Regularity of nursing with a long feeding interval contributes to the orderliness of the household and the rest and peace of mind of the mother. In this way, if in no other, it adds to the success of the nursing régime. Poorer class mothers, as a rule, are apparently able, and certainly seem willing, to nurse their infants for longer periods of time than do better class mothers. If the clinic mothers had been under closer medical supervision, it is possible that the differences between the two groups might be less striking.

REFERENCE

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THE DILUTION AND CONCENTRATION TEST OF RENAL FUNCTION*

Comparison of Results With Other Tests in One Hundred Cases

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ESTIMATES of renal function are generally based upon four criteria. The first of these is *urinalysis* with especial regard to the presence of albumin and formed elements. The obvious importance of this diagnostic criterion has long been recognized, and the comparatively recent contributions of Addis[1] suggest that refined urinalysis may have not only qualitative but quantitative value in estimating renal damage. A second criterion is the *excretory capacity* of the kidneys, which is generally measured in this country by means of the phenolsulphonphthalein excretion test of Rowntree and Geraghty[2]. MacLean's[3] urea concentration test, Addis'[4] urea index, and van Slyke's[5] index are also tests of excretory function. Third, the ability of the kidneys to *maintain water balance* between intake and output is a criterion of renal function. Since Korányi[6] showed that hyposthenuria, or inability to excrete concentrated urine, is characteristic of chronic nephritis, numerous clinical tests based upon observations of variation in urinary specific gravity have been devised. The fourth criterion is the ability of the kidney to keep the non-protein or *urea nitrogen of the blood* at a normal level. A disturbance of this ability is present only when there is marked renal failure. Consequently this test cannot help in the diagnosis of early or mild chronic nephritis. No one of these four criteria can completely serve as a diagnostic test to the exclusion of the others. It is desirable, however, that each be determined as accurately as possible.

Volhard[7] was the first to call attention to the practical value in diagnosis of the dilution and concentration tests. Strauss[8] combined these 2 tests into a single procedure which could be carried out in one day. Pratt[9] employed a method which was largely composed of details selected from the procedures of Volhard and Strauss.

In this series we have used a combined dilution and concentration test, following the procedure used by Pratt, who points out that failure to excrete water at a normal rate and in normal amounts, and inability to put out urine of high specific gravity, as well as the effect of extrarenal influences on the secretion of urine, are revealed more clearly by such a test than by a procedure such as the two-hour test of Hedinger and Schlayer[10] or Mosenthal[11].

There are frequent references to the dilution and concentration test in the literature, but we have found few articles by American authors in which actual experience with the test is reported. Pratt[9] analyzed his results in fifty-eight cases in 1926. Bunce[12] reports his experience with the Pratt procedure in a small series of cases. The procedure has been used in conjunction with other tests of renal function for the past three years in the Medical Clinic of the Boston Dispensary. It is simple to carry out and demands little technical ability or equipment.

The present paper is based upon the results obtained in one hundred cases with the following diagnoses: chronic vascular nephritis, 20; essential hypertension without demonstrable vascular change, 26; essential hypertension with definite signs of arteriosclerosis but with normal urinalysis, 10; hypertension with some measurable cardiac involvement, 27; neurasthenia without organic disease, 6; simple obesity, 4; and cardiosclerosis, aortic aneurysm, cancer of the cervix, back strain and subacute nephritis, 1 each.

The phenolsulphonphthalein excretion, fasting blood urea nitrogen, and non-protein nitrogen were measured in each patient. The subject was also given a dilution and concentration test as follows: At 9 a. m. the patient voids and the urine is discarded. He is then given 1000 c.c. of water, which he drinks in ten or fifteen minutes. The urine is then collected hourly, for four consecutive hours, i.e., 10 a. m., 11 a. m., 12 noon, and 1 p. m. Thereafter the urine is collected every two hours until 9 p. m. The urine voided between 9 p. m. and 9 a. m. the next day is collected in one portion. For lunch and supper, relatively dry food is given; the patient may have his choice of meat, eggs, potato, cheese and toast. If thirst becomes intense, a glass of water (250 c.c.) is allowed after 6 p. m. If the response to this test on the part of the kidneys is normal, a diluted urine, corresponding roughly in amount to the quantity ingested, is passed during the first four hours, and a concentrated urine during the rest of the day. The specific gravity normally falls to 1.002-1.005, and the amount excreted during the first four hours is equal to the amount ingested. During the remaining hours of the day, the specific gravity normally rises to 1.020 or above. The most concentrated specimen passed was examined for albumin. The sediment was inspected, and nitrogen (micro-Kjeldahl) and sodium chloride measurements were made. The latter determination proved of little value. The

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nitrogen excretion was found to be of some significance.

ANALYSIS OF CASES

1. Impaired Dilution

Fourteen cases showed abnormal dilution with normal concentration. Of these, not one showed altogether normal response to all of the other tests. In six, there was only questionable evidence of renal impairment. In the remaining eight, there was definite impaired kidney function. We take as evidence of kidney damage the presence of more than one of the following findings: a 2 hour intravenous phenolsulphonphthalein excretion of under 30%, a fasting blood non-protein nitrogen of over 40 mg. %, a fasting blood urea nitrogen of over 20 mg. %, a urinary nitrogen in the most concentrated specimen of under 700 mg. %, or albumin, casts and blood in the urine. On the basis of these findings, it appears that simple concentration tests do not give so much information as does the dilution and concentration test.

Failure to pass dilute urine might occur in the presence of dehydration, or if the patient had vomited a portion of the 1000 c.c. of water given at the outset of the test. Dehydration was eliminated as a factor by having the patients drink 6 glasses of water each day for 2 days before the beginning of the test. If impaired dilution occurs in the absence of these two conditions, it is not unreasonable to conclude that glomerular filtration may be imperfect, the filtrate passes slowly, and there is opportunity for high concentration by the tubular process of fluid absorption. If this be true, any functional test which measures chiefly the concentrating ability of the kidney, such as the Mosenthal two-hour test, or Fishberg's[12] test, will not reveal this type of renal insufficiency, whereas it might be shown by the Volhard or Pratt procedure. Fishberg's test measures solely the concentrating ability of the kidney while the Mosenthal test manifestly does not measure the full range of dilution and water excretion.

2. Impaired Concentration

There were nine cases showing normal dilution, but abnormal concentration. Eight of these gave very definite evidence in other ways of poorly functioning kidneys. In the other case, all the tests were repeated with the same results, namely, impaired concentration, but normal dilution, and a normal response to all the other tests.

We have recently been checking the dilution and concentration test with a simple concentration test similar to those of Fishberg[13] and Foster[14], performed about one week later. The patient is told to have his last meal at 5 p. m. Absolutely nothing is taken by mouth from this time until 11 a. m. the following day. The bladder is emptied on retiring and again on arising. One specimen is collected at 9 a. m. and another at 11 a. m. These are tested simply for specific gravity with corrections for temperature. Of fifteen cases studied in this way, twelve were unable to concentrate as well as in the dilution and concentration procedure outlined above. One gave the same concentration response, and two were able to concentrate to a greater degree than during the dilution and concentration test. The maximum concentration of urine in one patient only reached a specific gravity of 1.019 in the simple concentration test, whereas in the complete dilution and concentration procedure it reached 1.029. Other differences were a maximum of 1.012 vs. one of 1.025; another, 1.021 vs. 1.030; 1.015 vs. 1.023; 1.017 vs. 1.022, and so forth, the higher gravities being recorded in the combined dilution and concentration test. The criticism may justly be made that some of these patients might have taken some fluid, although they were given written and verbal instructions not to do so, and all reported that they had obeyed orders. Even if this factor can be controlled, it is still felt that a simple concentration test, while it has many advantages, is not so satisfactory as the combined dilution and concentration test.

3. Impaired Dilution and Concentration (Table I)

Eleven cases failed both to dilute and to concentrate normally. With but one possible exception, these patients all showed corroborative evidence of impaired renal function. The one exception showed a dilution of 1.007 and a concentration of 1.018 with 810 mg. % of urinary nitrogen and also albumin in the urine. In addition to hypertension and cardiosclerosis, this case was shown by pyelogram to have a marked right hydronephrosis and a large stone in the left renal pelvis. It may be stated, then, that all the cases in this series which showed both abnormal dilution and concentration were cases with diseased or abnormal kidneys.

4. Four-hour Output

The average output of urine, four hours after the ingestion of a liter of water, was 1122 c.c. for the entire group of one hundred patients. There was a wide individual variation, but the general range lay between 700 and 1400 c.c. The average elimination is roughly equal to the intake. The patients with essential hypertension had a four-hour average output of 1046 c.c., those with the cardiac involvement 1005 c.c., patients in whom hypertension was associated with conditions other than heart disease 1260 c.c., a group of miscellaneous conditions averaged 1040 c.c., and our neurasthenics had a high four-hour elimination, the average being 1280 c.c.

There were seventeen cases with a four-hour urinary output of less than 700 c.c. following the

ingestion of 1,000 c.c. of water. Thirteen of these responded abnormally to the dilution and concentration test. Six failed to dilute sufficiently, two failed to concentrate, and five neither diluted nor concentrated normally. Nine of ten cases with a four-hour output of less than 600 c.c. showed an abnormal dilution and concentration test in addition to other evidence of kidney damage. Only one of these 10 was able to dilute beyond 1.005. (Table II.)

In fifteen cases the output exceeded 1,500 c.c. within four hours after the ingestion of a liter of water. Twelve of these fifteen had a diagnosis of essential hypertension, while the remaining three were cases of neurasthenia, cardiosclerosis, and secondary anemia, respectively. The preponderance of hypertensives in this subgroup may be accounted for by the fact that a majority of the whole group of one hundred cases were cases of essential hypertension. However, it is not unlikely, as Lange[15] points out, that the hypertension may be a real factor in the production of this excess output. Pratt finds an increased four-hour output common in neurasthenia. The disturbing effect of vasomotor instability has been cited repeatedly as one of the sources of misinterpretation of the dilution and concentration test.

TABLE I

IMPAIRED DILUTION AND CONCENTRATION

Range of dilution and concentration of urine (last two figures of specific gravity)	Phenolsulphonphthalein excretion two hours after injection	Fasting blood non-protein nitrogen mg./100 c.c.	Fasting blood urea nitrogen mg./100 c.c.	Four-hour urinary output after ingestion of 1000 c.c. water	Urinary nitrogen of most concentrated specimen of urine mg./1000 c.c.	Urinalysis
09-17	14 per cent.	65 mg.	31 mg.	890 c.c.	1558 mg.	albumin, casts, blood
07-18	15 " "	51 " "	29 " "	790 "	810 "	albumin
06-19	51 " "	30 " "	9 " "	750 "	612 "	albumin, casts
09-16	24 " "	36 " "	15 " "	720 "	558 "	albumin, casts
08-14	26 " "	35 " "	14 " "	1010 "	396 "	albumin, casts, blood
06-07	24 " "	41 " "	16 " "	380 "	344 "	albumin
10-19	19 " "	38 " "	19 " "	190 "	846 "	albumin, casts, blood
06-14	14 " "	73 " "	31 " "	565 "	828 "	albumin, casts
10-14	10 " "	88 " "	68 " "	530 "	450 "	albumin, casts, blood
10-15	23 " "	64 " "	34 " "	360 "	654 "	albumin, casts, blood
07-18	56 " "	26 " "	12 " "	1100 "	576 "	albumin

TABLE II

FOUR-HOUR OUTPUT OF LESS THAN 600 C.C. AFTER INGESTION OF 1000 C.C.

Four-hour urinary output after ingestion of 1000 c.c. water	Phenolsulphonphthalein excretion two hours after injection	Fasting blood non-protein nitrogen mg./100 c.c.	Fasting blood urea nitrogen mg./100 c.c.	Range of dilution and concentration of urine (last two figures of specific gravity)	Urinary nitrogen of most concentrated specimen of urine mg./1000 c.c.	Urinalysis
425 c.c.	15 per cent.	31 mg.	9 mg.	06-27	990 mg.	negative
490 "	80 " "	38 " "	16 "	0-25	1356 "	casts
380 "	24 " "	41 " "	16 "	06-07	344 "	albumin
190 "	19 " "	38 " "	19 "	10-19	846 "	albumin, casts, blood
545 "	2 " "	32 " "	10 "	05-10	216 "	albumin, blood
565 "	14 " "	73 " "	31 "	06-14	828 "	albumin, casts
530 "	10 " "	88 " "	68 "	10-14	450 "	albumin, casts, blood
556 "	56 " "	52 " "	23 "	06-25	360 "	albumin
360 "	23 " "	64 " "	34 "	10-15	654 "	albumin, casts, blood
590 "	53 " "	31 " "	13 "	06-24	750 "	albumin, casts

5. *Low Urinary Nitrogen*

Low nitrogen concentration (less than 600 mg. per 100 c.c.) was usually associated with other evidence of unsatisfactory renal function. Fourteen cases had a total urinary nitrogen in

the most concentrated specimen of less than 600 mg. per 100 c.c. Eleven of these fourteen had abnormal dilution and concentration tests. Of the three cases which responded normally to the dilution and concentration test, one had a blood non-protein nitrogen of 41 mg.%, while the other two gave no evidence of kidney damage.

6. Comparison of Dilution and Concentration Tests with Phenolsulphonphthalein Excretion

There were fourteen cases in this series with a phenolsulphonphthalein excretion of less than 30% in two hours, following intravenous injection, indicating, according to the standards of this test, definitely impaired renal function. Of these, thirteen showed abnormal dilution, concentration, or both. The one exception was a patient with hypertension (blood pressure 268/112) and cardiosclerosis, whose chief symptom was rather marked dyspnea. The blood examination on this man showed a hemoglobin of 65% (Sahli) and 4,215,000 red cells per cu. mm. This picture of secondary anemia with a high color index, according to Ashe[16], is more consistent with myocardial insufficiency than with nephritis. The blood nitrogen, the four-hour output, and the urinary nitrogen were normal. Only a rare hyaline cast was found in the urinary sediment and there was no albumin. The low phenolsulphonphthalein excretion may well have been due to the cardiac condition, and the normal response to the dilution and concentration test may correctly indicate that there was no appreciable kidney damage.

Nine patients had a normal phenolsulphonphthalein excretion of 50% or over, but showed abnormal dilution and concentration. Seven of these had further signs of impaired renal function. For example, one case showed 52 mg. % of non-protein nitrogen, 29 mg. % of blood urea nitrogen, 576 mg. % of urinary nitrogen, and albumin in the urine, yet excreted 53% of phenolsulphonphthalein in two hours. The range of dilution and concentration in this case was 1.000 to 1.013.

It is thus observed in our series that those cases which have a low phenolsulphonphthalein excretion (below 30%) show an abnormal response to the dilution and concentration test; on the other hand, there are some cases with definitely impaired kidney function which show a normal phenolsulphonphthalein excretion. In these, the dilution and concentration test reveals the true condition. The case of nephritis recently reported by Murphy[17], which was followed for five years, also showed a normal phenolsulphonphthalein excretion throughout the illness until just before death, and the first laboratory evidence of impaired renal function was diminution in the concentrating power.

7. Comparison of Dilution and Concentration Test with Blood Urea and Non-Protein Nitrogen

There were twelve cases with a fasting blood non-protein nitrogen of over 40 mg. %, and ten cases with more than 20 mg. % of blood urea nitrogen, figures which we may arbitrarily consider the upper limits of normal. Not one of these twenty-two patients responded normally to the dilution and concentration test. It seems, therefore, that patients in whom kidney damage has reached such a degree that azotemia is developing consistently display abnormal diluting or concentrating ability, or both.

8. Advanced Nephritis (Table III)

Eight cases showed a phenolsulphonphthalein excretion of less than 30% together with a non-protein nitrogen above 40 mg. or blood urea nitrogen above 20 mg. per 100 c.c. The dilution and concentration test was abnormal in all of these; none was able to excrete a liter of

TABLE III

ADVANCED NEPHRITIS

Fasting blood non-protein nitrogen mg./100 c.c.	Fasting blood urea nitrogen mg./100 c.c.	Phenolsulphonphthalein excretion two hours after injection	Range of dilution and concentration of urine (last two figures of specific gravity)	Four-hour urinary output after ingestion of 1000 c.c. water	Urinary nitrogen of most concentrated specimen of urine mg./1000 c.c.	Urinalysis
65 mg.	31 mg.	14 per cent.	09-17	890 c.c.	1558 mg.	albumin, casts, blood
51 "	29 "	15 " "	07-18	790 "	810 "	albumin
52 "	29 "	53 " "	0-13	760 "	576 "	albumin
61 "	39 "	21 " "	04-16	980 "	684 "	albumin
73 "	31 "	14 " "	06-14	565 "	828 "	albumin, casts
88 "	68 "	10 " "	10-14	530 "	450 "	albumin, casts, blood
52 "	23 "	56 " "	06-25	556 "	360 "	albumin
64 "	34 "	23 " "	10-15	360 "	654 "	albumin, casts, blood
44 "	22 "	47 " "	08-30	1760 "	1242 "	albumin, casts
43 "	18 "	19 " "	05-16	630 "	630 "	albumin, casts
41 "	16 "	24 " "	06-07	380 "	344 "	albumin

water four hours after ingesting it, and only three were able to excrete 700 c.c. (the low standard which we used in this series as a normal response). In addition, it may be noted that all but two of these patients showed a marked reduction in nitrogen content in the most concentrated specimen, and all showed abnormal urinalysis.

SUGGESTED PLAN FOR AMBULATORY PATIENTS

Probably the greatest disadvantage of this test, as it is here outlined, is that it must be carried out in a hospital. If the test could be satisfactorily performed upon ambulatory patients without requiring hospitalization, it would deserve and attain wider use. A plan, which may be carried out in the dispensary or office practice, is here suggested.

Of the series of one hundred cases, only nine failed to show their maximum dilutions at 11 a. m. Of these, five showed the greatest dilution at 10 a. m., three at 12 noon, and one at 1 p. m. A maximum concentration, on the other hand, was shown in the overnight specimen collected at 7 a. m., in all but eight of the series. In five of these eight, the greatest concentration was shown in the last evening specimen collected at 9 p. m. Thus, about 90% of the patients showed a maximum dilution at 11 in the morning, and a maximum concentration in the specimen collected at 7 o'clock the following morning. A possible simplification of the dilution and concentration test, then, would be to examine only these two specimens for specific gravity. The most concentrated specimen could be used for the albumin test and inspection of the sediment.

We have carried out this simplified dilution and concentration test in a number of our patients, in both dispensary and office practice. The patient is asked to follow the plan as originally outlined, discarding all except the 11 A. M. and overnight specimens. If these specimens show normal dilution and concentration, nothing further is necessary. If these are not within normal limits, a more complete test is performed, the patient being given the following instruction sheet:

DIRECTIONS FOR THE PATIENT

On ———— (date) carry out the following instructions:

7:00 A. M. Pass urine and throw away.
No breakfast. No water. Absolutely nothing by mouth. Nothing to eat or drink except as directed.

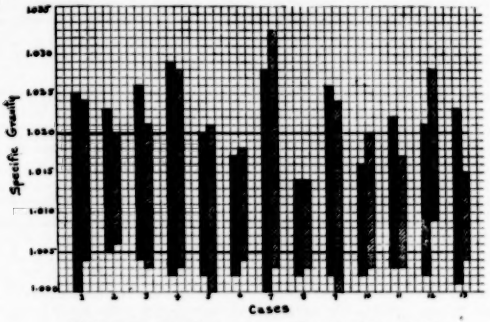

FIGURE 1. Comparison of the range of urinary specific gravity in the dilution and concentration test. The black vertical bands represent the results in the hospital procedure and the hatched bands represent the results in the modification for ambulatory patients. The horizontal lines at 1.020 and 1.005 represent the minimal normal range of specific gravity.

9:00 A. M. Pass urine and throw away. Drink 4 full large glasses of water within 10 minutes.
9:30 A. M. Collect urine in a bottle marked 9:30 A. M. and *save*.
10:00 A. M. Collect urine in a bottle marked 10:00 A. M. and *save*.
10:50 A. M. Be at Dispensary and bring the bottles marked 9:30 and 10:00 directly to the laboratory on the 3rd floor of the Dispensary.
11:00 A. M. Take Laboratory Test.
(The 2 hour Phenolsulphonphthalein test is performed at this time and the 11:00, 12:00 and 1:00 o'clock specimens are collected.)
1:00 P. M. May go home. After going home drink nothing. Eat only as directed.
1:30 P. M. *Lunch:* 1 boiled egg, buttered toast, salt to taste.
3:00 P. M. Pass urine and throw away.
5:00 P. M. Pass urine and throw away.
5:30 P. M. *Dinner:* Meat, potatoes, bread, salt to taste.
7:00 P. M. Pass urine and throw away.
9:00 P. M. Collect urine in the bottle marked 9:00 P. M. and *save*.

Collect in a large bottle marked "night specimen" all urine passed after 9 P. M. and including that at 9 A. M. next day. This is the twelve-hour night specimen. After this specimen is collected, bring this and the bottle marked 9:00 P. M. to the laboratory at Dispensary within 2 hours.

After 9:00 A. M. anything to eat or drink as desired.

The patient has thus spent only two hours at the clinic, but the phenolsulphonphthalein test, the maximum dilution, and the four-hour output after the ingestion of a liter of water have been obtained. The maximum concentration will usually be obtained in one of the two specimens brought in the following morning, and this specimen may be examined for albumin, casts, and blood.

Thirteen patients who had the complete twenty-four hour hospital test were given the above ambulatory modification within one week with results as illustrated in figure I. There were only 2 cases which failed to concentrate normally (to 1.020 or over) in the ambulatory test, yet did concentrate normally in the more elaborate procedure. There was only one case in which the dilutions in the two tests varied to any considerable degree. It was observed that these tests actually checked more closely than two-hour intravenous phenolsulphonphthalein tests which were done during both procedures.

The inconvenience of such a test is little more than that involved in the simple phenolsulphonphthalein test, but much valuable additional information is secured. The test may, of course, be begun at 7 or 8 o'clock in the morning, and the first part finished at 11 or 12. Obviously, the principal objection to such a test is the lack of adequate control. However, if normal values are obtained after such a procedure, it is of no importance whether it was carried out faithfully. If abnormal values result, the original test, requiring twenty-four hours' observation, may always be resorted to.

SUMMARY AND CONCLUSIONS

The dilution and concentration test of kidney function has been performed in a hundred patients and compared with other tests of renal function. The advantages of the dilution and concentration test are its sensitivity, its ease of performance, no special laboratory equipment or technical ability being required, its adaptation to the ambulatory patient, and the possibility of its combination with other tests if necessary.

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DIVERTICULOSIS OF THE APPENDIX

BY JOHN D. STEWART, M.D.*

DIVERTICULOSIS of the vermiform appendix is a subject which has received scant consideration in the literature, although in the past ten years reference to the condition has been less uncommon, particularly in foreign publications. My attention was drawn to the condition by two cases encountered on the Surgical Service at the Massachusetts General Hospital in a period of less than six weeks.

Diverticulum formation in the appendix is rare. The incidence as estimated by different writers, varies from 0.28 per cent., as given by Moschowitz[10], to Stout's figure[6], 1.90 per cent. MacCarty and McGrath[2] found seventeen cases in five thousand appendices. Undoubtedly, however, the condition is more common than is generally realized and closer search and better technique in the examination reveal additional cases. The usual method of sectioning the appendix for pathological examination is to make two or more cross-sections from the part of the specimen showing obvious, gross changes. Stout[6] examined all the appendices removed in one year at the Presbyterian Hospital in New York City, using longitudinal sections through the mesenteric-anti-mesenteric borders, and found five examples of the condition, whereas in the previous ten years only one was recorded.

The diverticula, sometimes single, usually are multiple. They commonly occur along the mesenteric border of the appendix, extending out between the leaves of the mesenteriolum. They may be found also on the convexity of the appendix and near the tip. Their size is

*Stewart—Surgical House Officer, Massachusetts General Hospital. For record and address of author see "This Week's Issue", page 1304.

variable, ranging from one to fifteen millimeters in diameter. In the larger ones the mucosal lining is often lacking. The muscularis is not present in the wall of the diverticula, and hence they are of the "acquired" variety of intestinal diverticula, representing an evagination of the mucosa, muscularis mucosae, and submucosa through a defect in the musculature. The serosa and subserosa form the outer layers of the sac. No case is recorded in which all the intestinal coats are represented in the protrusion from the appendiceal lumen.

The blood vessels of the appendix pierce the muscularis along the mesenteric border in six or more places, usually at right angles. A smaller number of vessels pass around in the subserosa to the anti-mesenteric border, and then perforate the muscularis to form the submucous plexus. At the site of entrance of each vessel a defect is found in the muscularis. The size of the opening varies and the perivascular space is filled with a plug of fatty and areolar tissue. These so-called hiatus musculares are weak spots in the wall of the appendix, and most diverticula are found in association with them. A smaller number are secondary to inflammatory changes in the wall of the appendix. An intramural abscess, by destroying the muscularis, leaves a weak scar, the site of a potential hernia. More extensive exudative inflammation leaves larger non-resistant areas in the appendix wall.

Most of the writers who have touched on the subject have interested themselves chiefly in the morphology of appendiceal diverticula and their mode of formation. The theories offered in explanation of diverticulation elsewhere in the intestinal canal have been invoked here. It was proposed long ago (Klebs, 1869) that in obese people there is an increase in the perivascular fat deposits, tending to increase the size of the defect in the muscularis. Chronic distention of blood vessels, serving to push aside the muscle bundles was suggested by Graser. Constipation and prolonged distention of the bowel, plus muscle degeneration and inherent weakness have been considered causative factors. Rapid weight loss with disappearance of the fat about the vessels and at the same time weakening of the muscle were believed by Aschoff to be of importance.

Stout[6], after an experimental study of diverticulum formation in the appendix, offers a more convincing explanation of their origin. He concluded that the force resulting in herniation of the appendix wall is due to contraction of the circular and longitudinal muscle fibers, and tending to substantiate this view was his observation that the muscularis was much thicker, as if hypertrophied, in the appendices in which diverticula were found. Some degree of obstruction to the lumen proximally was demonstrable in the cases he studied, and probably always is present in this condition. The fact that diverticula are found more commonly in retrocecal appendices suggests the importance of inadequate drainage in their etiology and does not militate against Stout's views.

Diverticula of the appendix are probably not of great clinical importance. They are practically always found in appendices subject to acute or chronic inflammation, and undoubtedly perforation occurs in them more readily than in the appendix wall of normal thickness and supported by the resistant muscularis. In many of the cases of diverticula described in the literature perforation was found at operation. At the same time these outpocketings in the wall of the appendix are more apt to become infected than is the rest of the organ. The narrow neck, the fact that the sacs are not emptied by the normal contraction of the appendiceal musculature and the absence of the protective mucosal lining in the larger diverticula augment the danger of this. Chase concludes that the condition offers an explanation of the recurring subacute appendicitis terminating suddenly in perforation. The term "diverticulitis of the appendix" would be appropriate in these cases. The condition has been successfully diagnosed by x-ray.

The presence of diverticula in a badly inflamed appendix obviously increases the danger of rupture during appendectomy, with contamination of the operative field. In one of the cases noted below rupture of a diverticulum occurred in removing the appendix. In the second case rupture probably occurred as the organ was being freed. Pack and Scharnagel[7] point out that the location of the diverticula between the leaves of the mesenteriolum, often hidden by fat, favors incision of the sac in separating the appendix from its mesentery.

The relationship between diverticulosis of the appendix and the rare condition, pseudomyxoma peritonei, is an interesting field for speculation. According to Gardham[8], in almost all the cases of pseudomyxoma of the peritoneum arising from the appendix the organ showed diverticulum formation. Neumann (quoted by Gardham) reported that there were diverticula of the appendix in four of the eight cases of pseudomyxoma peritonei investigated by him. It is stated by Choyce that Trotter, in 1910, found nine cases of pseudomyxoma peritonei of appendicular origin and added a case of his own. Ries points out the importance of diverticula of the appendix and mucocele of the appendix as the source of pseudomyxoma peritonei. Cases are recorded in which the condition seemed to arise both from ruptured ovarian cysts and from ruptured diverticula of the appendix. In what manner the diverticula give rise to the collections of adherent pseudomucin in the peritoneal cavity is unknown. One theory holds that the diverticula rupture and are surrounded by omentum; bits of mucosa then become vascularized through the omentum and the mucosal

cells continue their secretory activity in a parasitic intraperitoneal existence. But at least it is certain that in any case of pseudomyxoma of the peritoneum the appendix, as well as the ovaries, and less importantly vestiges of the omphalomesenteric duct should be suspected.

CASE REPORTS

CASE 1: I. W. Aet. 55, male. One year before admission the patient had an appendix abscess drained without removal of the appendix. Ten weeks later he entered the Massachusetts General Hospital with a fluctuant mass in the region of the healed operation wound. The abscess was drained. At the second admission to the hospital the patient complained of intermittent epigastric and right lower quadrant pain, accompanied at times by vomiting, the symptoms being of three months' duration. At operation the appendix was found lying lateral to the cecum. It was removed by blunt dissection, and there was noted a little escape of contents from its tip in freeing it. Examination showed that the appendix was slightly oedematous and injected, and the distal half was moderately dilated and fluctuant. There were three small fluctuant rounded diverticula three to four millimeters in diameter in the dilated portion, not at the mesenteric border. The appendiceal lumen was obliterated near the proximal end. Microscopic examination showed evidence of subsiding acute inflammation of the walls of the appendix, with the usual cellular infiltration. The diverticula were thin-walled, the muscularis was lacking, and they were the seat of active inflammatory changes.

CASE 2: E. B. Aet. 16, female. One month before admission the patient had transient sharp pains in the right lower abdominal quadrant, without nausea. The present attack began thirty hours before admission with central abdominal pain, later settling in the region of McBurney's point and accompanied by vomiting. At operation a thickened oedematous appendix was found retrolateral to the cecum, and the tip was firmly adherent to the cecal wall. In separating the appendix from the cecum at one point a drop of pus appeared, suggesting that the lumen of the appendix had been opened. The site was drained. Microscopic examination showed the usual picture of acute appendicitis. In addition the section showed a diverticulum about five millimeters in diameter on the mesenteric border of the appendix. It was bottle-shaped and extended up along the appendix a short distance. The mucosal lining was ulcerated, but no perforation was demonstrated in the sections. The muscularis was not present in the wall of the diverticulum, but all the other layers of the appendix wall were represented. The submucosa was thinned out.

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AN UNUSUAL CASE OF OSTEOMYELITIS IN AN INFANT

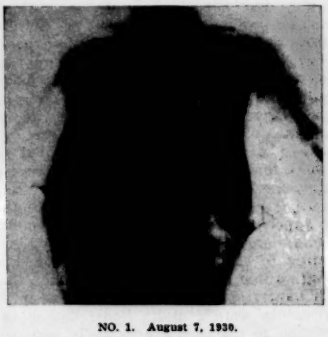
BY ALLEN G. RICE, M.D.,* AND PHILIP G. CORLISS, M.D.*

THE following case of osteomyelitis is reported because of the extremely early age at which it developed. It may also serve as a reminder of the danger inherent in a staphylococcus abscess and the respect with which such infections should be regarded.

The patient, Baby Dorothy M., was born in another hospital in Springfield, Massachusetts, on July 12, 1930. The delivery was normal; the birth weight, seven pounds and eight ounces. She was the sixth child, all pregnancies having been normal, and the other children all in good health. The mother was forty-four years old. The infant was breast fed and did well.

The mother and baby were discharged from the maternity hospital eleven days postpartum. The mother had noticed milk in the child's breasts. None of her other children had developed this condition. Shortly after they had gone home, an abscess developed in the infant's right breast. One week later this was lanced by the family physician, and hot packs applied. Two days later two more abscesses developed in the same breast and were lanced.

During the following days several more abscesses were opened. August 4 the left arm began to swell from the shoulder to the fingers, most marked in the upper arm. On August 7 the attending physician sent the baby to a roentgenologist, who reported no fracture, no dislocation and no evidence of disease. (See x-ray Photo No. 1.)



NO. 1. August 7, 1930.

The arm was incised and the incision became the opening of a discharging sinus. As the baby failed to improve, she was admitted to the Surgical Serv-

*Rice—Visiting Surgeon to Springfield Hospital, Springfield, Mass. Corliss—House Officer, Springfield Hospital, Springfield, Mass. For records and addresses of authors see "This Week's Issue", page 1304.

ice of the Springfield Hospital on August 18, thirty-seven days after birth.

Examination showed a well-developed and nour-

NO. 2. August 18, 1930.

ished baby girl, five weeks old, weighing eight pounds and twelve ounces. The skin and mucous membranes were pale. The temperature was 98.6°.

The left arm and hand were hugely swollen, discolored and shiny. It looked as if the skin were about to burst. On the anteromedial surface of the upper arm, at the junction of the proximal and middle thirds, was a discharging sinus about 1 cm. in diameter.

An x-ray picture by the same roentgenologist was taken, which is shown herewith. (See x-ray Photo No. 2.) Operation was imperative, but it was gravely doubted if the infant's condition would stand it. The arm was incised under ether. A large amount of pus under some pressure was released. The entire humerus crumbled itself out of the wound. The baby apparently stood the operation and anaesthesia well, which lasted only fifteen minutes. She was back in the Ward soon after noon. She did not take her formula well. Her temperature dropped to subnormal and she became very pale. That night at 3:10 A. M. she died.

SUMMARY

A case of extensive osteomyelitis involving the left humerus in a female infant five weeks old is reported. The condition followed multiple abscesses in the lactating breast of the infant. Operation was followed in less than twenty-four hours by death.

IMPORTANCE OF ROUTINE BACTERIAL EXAMINATIONS IN LAPAROTOMIES BASED ON A CASE REPORT

BY PEIRCE H. LEAVITT, M.D.*

CONSIDERABLE has been written on the subject of fatal infections following laparotomies. The cause has been attributed to the nasal and oral discharges of the operating team, and sufficient proof has been presented by Meleney[1, 2, 3], and Walker[4] to convince us that this source may be very definite. The cause has also been found to be within the patient himself and for this reason we wish to present this case, with a very definite recommendation.

G. H. Surgical record No. 11,738, female, 32, married, white. Admitted May 3, 1930, at 3 P. M. with the following story. Referred to the hospital by Dr. Brenner of North Easton, Mass.

Family—2 children living and well. Youngest 3 years, no miscarriages. Father and mother living and well. No tuberculosis or cancer in family. Ordinary childhood diseases with no evidence of residual except repeated attacks of tonsillitis at varying intervals. The attacks have been sharp and severe, but of short duration. Local doctors have advised the removal of tonsils. Two days before admission she complained of sore throat but today there is no discomfort in the throat. The patient is 6½ months pregnant.

Present illness—This morning early she had general abdominal pain which, after a few hours, was localized in the right lower quadrant. Some vomiting occurred after the pain started. Bowels had moved. No urinary symptoms. No catharsis.

Physical Examination—Generally negative. Heart and lungs show no evidence of pathology. Throat slightly reddened. Tonsils large, but with no white spots. No glandular enlargement and no tenderness in the neck. Local examination showed the abdomen enlarged to the size of 6½ months pregnancy. Localized tenderness and spasm demonstrated at McBurney's point. Vaginal examination not made. Temp. 100.6°. Pulse 84. Respiration 26. W. B. C. 28,200. Cath. spec. of urine: amber—acid reaction albumen, s. p. t., no sugar; sediment; yeast cells.

Preop. Diag.: Acute Appendicitis.

Operation advised and performed May 3, 1930—started 4:10 P. M., ended at 4:40.

Ether with the usual preparation. McBurney incision. Abdomen opened without difficulty. Immediately upon opening the peritoneum some cloudy fluid was visible. A culture was taken. The appendix was found between the uterus and lateral abdominal wall, about 4 inches long, markedly fibrinous, reddened and injected, with no areas of gangrene, or any evidence of leakage. The appendix was removed, the stump cauterized with actual cautery and inverted. Meso-appendix ligated. Sponge count correct and the wound was closed in layers without drainage.

May 4. Good ether recovery. The patient soon began to have severe abdominal pain and weakness. Temp. 103°. Pulse 130 to 140. General condition very poor. Examination 28 hours after operation showed planted culture from abdominal cavity contained pure culture short chain streptococci (haemolytic streptococcus). Serum was given and general supportive treatment employed.

May 6. The patient died at 10 P. M. with characteristic symptoms and signs of general septicemia. Autopsy refused.

Pathological examination of appendix No. 5-3030. Specimen shows an appendix 4 inches long x 1¼ inches wide, covered with yellowish material. Microscopic examination shows the wall swollen with acute inflammatory exudate consisting chiefly of polymorphs, with serum, few red cells, and an oc-

*Leavitt—Surgeon, Goddard Hospital, Brockton. For record and address of author see "This Week's Issue", page 1304.

casional lymphocyte. DIAGNOSIS: Acute Appendicitis.

The appendix at operation appeared to be typically acute, distinctly of the type that we do not drain, and in which the postoperative convalescence is uneventful.

The original focus of infection was presumably in the tonsils, although the latter were apparently quiescent at admission and without active symptoms. In fact the story of the tonsillar attack was obtained after careful questioning, and then only by the husband's prompting.

The object in reporting this case is to recommend the culturing of all cases in which there is free fluid in the abdominal cavity. Occasionally very important information will thereby be obtained, and the burden of the cause of death will be placed where it belongs. What is a simple routine may be the means of satisfactorily explaining to relatives and friends a situation which has often been the cause of criticism. It may relieve the surgeon of responsibility for an unfavorable result.

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INVESTMENT IN HOSPITAL PLANTS AND EQUIPMENT

Investment in the 7,310 hospitals of the United States has made them one of the nation's major industries, according to figures gathered by Dr. C. Rufus Rorem, economist on the staff of the Committee on the Costs of Medical Care.

Dr. Rorem places the total value of hospital plants and equipment at $3,125,123,000, or more than the total investment in the lumber or paper and printing industries, for instance. The annual cost of operation is $900,000,000, or nearly one-third of the total yearly expenditures of the Federal government.

This sum provides and maintains 904,934 beds in public and private hospitals for Americans unlucky enough to be seriously ill in mind or body. Ninety-one per cent. of the investment is on a non-profit basis, provided in about equal proportions by governments and private associations. Taking the country as a whole there are enough beds to give every man, woman and child one day in a hospital every year. Because of the uneven distribution of hospital resources, however, the average person in the Far West could be given hospital care one day out of each 232, in the North and North Atlantic States one day out of each 245, and in the South and South Atlantic States only one day out of each 539.

Though there are probably enough beds in American hospitals to meet present-day needs, many communities remain without hospital facilities. At the same time a large number of hospitals normally operate below their full capacity.

Federal, state and local governments, the report declares, play the largest part in providing hospital service. Ninety-five per cent. of all nervous and mental cases in hospitals and 75 per cent. of all hospitalized tuberculosis cases are in government-supported institutions. About $800,000,000 has been invested in hospitals by the State governments, $200,000,000 by the Federal government, and $187,000,000 by counties. Religious groups have invested $677,000,000 in plants and equipment and other private organizations about $700,000,000.

General hospitals accounted for 60 per cent. of the investment, nervous and mental institutions for 27 per cent., and tuberculosis hospitals for 6 per cent.

In recent years hospitals have multiplied rapidly, Dr. Rorem's survey showed. All but 661 of those now in existence have been organized since 1875 and all but 2,070 since 1900. The number of available hospital beds has been increasing at the rate of about 20,000 a year.

Contrary to general impression endowments play but a small part in paying for hospital care, amounting to an income of about 8 cents a day for each hospital bed. The average daily cost of maintaining such a bed is put at about $5. In endowment funds the North and North Central States are most highly favored, having 70 per cent. of the total for the country.

Practically all hospitals, if considered as business enterprises, are run at a heavy loss. Patients on the average pay less than the cost of the service furnished. In 57 New York hospitals patients as a group paid only about two-thirds.

One object of the survey was to discover the costs of hospital service, with a view to determining how large a part should be borne by the patient and how much by the general public. The work is part of the exhaustive five-year inquiry into America's health problems now being made by the Committee on the Costs of Medical Care, made up of physicians, economists and representatives of the public under the chairmanship of Secretary of the Interior Ray Lyman Wilbur.

Case Records

ANTE-MORTEM AND POST-MORTEM

AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

AT THE

MASSACHUSETTS GENERAL HOSPITAL

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Published under the direction of

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CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 16521

PAIN IN BOTH LEGS WITH URINARY FREQUENCY

MEDICAL DEPARTMENT

An American widow sixty-seven years old entered September 19 complaining of nervousness, pain in both legs, frequency and burning.

Fourteen years before admission she was in bed for five weeks with a "nervous breakdown" following the sudden death of her husband. Ever since that time she had been very unstable. About once a year she would go to pieces upon slight cause and have to go to a rest home or to a friend for several weeks. The last illness of this sort occurred a year before admission, following a fall. She was not hurt, merely shaken up somewhat, but went to bed for three weeks. Four years before admission she began to have pain in the feet and dull aching of the legs and hips towards the end of the day. These symptoms increased so that for the past two years walking had been very hard for her. The dull ache was constantly present, perhaps somewhat more severe in the hips and aggravated by going upstairs. There was no change with the weather and no heat or swelling of the joints. She had no symptoms above the hips except that for a few days two years before admission her right elbow was slightly swollen and painful. She had gone to various doctors who strapped her feet and gave her pills with no relief. She had continued to do her housework until six weeks before admission. Then she suddenly developed marked frequency of urination, eight to ten times at night and about once an hour during the day, passing small amounts with considerable burning. Five or six times she had noted blood but could not tell whether it came from the vagina, the urethra or the rectum. For the past three weeks she had had constant itching of the vulva.

Twenty-five years before admission she had a pelvic operation the nature of which she did not know. She had not menstruated since that time. For the past ten years she had had a sore on her left leg. For the past five years she had had slight occasional blurring of vision and moderate shortness of breath. Three years before admission she was in bed for three weeks with an attack of pneumonia.

Her father died at seventy-eight of heart trouble. Her mother died of shock. Two brothers and one sister died with pulmonary tuberculosis. She lost three children in infancy, one a blue baby.

Clinical examination showed an obese woman. There were dullness and moisture at the bases of both lungs. The heart sounds were faint. The left border of dullness was 10 centimeters to the left of midsternum, 3 centimeters outside the midclavicular line. The right border of dullness was 4 centimeters to the right, the supracardiac dullness 5 centimeters. No murmurs. Pulses and arteries normal. Blood pressure 170/90. The abdomen was too obese for satisfactory examination. Pelvic examination showed moderate leukorrhea, the labia red, the cervix lacerated and eroded. Rectal examination showed external hemorrhoids and a very tight sphincter. The extremities showed varicose veins and considerable edema. There was an old varicose ulcer on the left shin. There was considerable limitation of motion of the hips, slight limitation of the knees. There were Heberden's nodes and slight deformity of the hands. The pupils and reflexes were normal.

The amount of urine was normal when recorded. Three catheter specimens of urine showed a specific gravity of 1.016 to 1.035, the slightest possible trace to a trace of albumin in all. The sediment of all three was loaded with leukocytes, rare red cells in two specimens. Benedict's test slightly positive in two of four specimens. The renal function was 25 per cent. The blood showed 6,800 to 44,000 leukocytes, polynuclears 62 to 82 per cent, hemoglobin 75 per cent, reds 4,600,000, smear normal. Hinton negative. Non-protein nitrogen 21 milligrams September 20, 58 September 27, 68 September 29, 60 September 30, 71 October 1.

X-ray examination showed considerable new bone formation about both hip joints. The joint spaces were narrow. There was deformity of the head of the left femur. There were also similar changes about the sacro-iliac, vertebral and knee articulations. The hands also showed extensive arthritic changes characterized by narrowing of the joint spaces and irregularity of the joint outlines. The sinuses were clear. The measurements of the heart shadow were within normal limits. The aorta was tortuous, suggesting arteriosclerosis. The chest was clear. The kidney outlines were visible and appeared normal. There were no shadows suggestive of stones. There were advanced arthritic changes about the sacro-iliac and hip articulations. There was narrowing of the joint spaces and considerable new bone formation.

The patient was put upon digitalis the day of admission. September 23 she was nauseated all day and had questionable yellow vision. September 24 the digitalis was omitted and she was put upon sodium salicylate.

September 26 the patient was very drowsy.

Nothing new was found. September 27 venesection was done and 500 cubic centimeters of blood withdrawn with a consequent fall in hypertension. The left pupil was widely dilated and did not react. Homatropin had been used twenty-four hours before. The right pupil was normal. The grips were very weak but equal. The heart and lungs were negative. There was persistent tenderness in the left lower quadrant on pressure. September 29 the blood pressure was 175/100. September 30 she continued in a semi-stuporous state. The left pupil was still dilated and did not react. The tenderness in the left lower quadrant persisted. She was incontinent of urine and feces. The temperature was 102°, the pulse 145, the respiration 44. A lumbar puncture was negative. October 1 the pulse was 150 and barely perceptible, the respirations 50. The patient was completely unconscious. Early in the morning October 2 she died.

Clinical Discussion

BY RICHARD C. CABOT, M.D., AND GEORGE W. HOLMES, M.D.

NOTES ON THE HISTORY

The "nervous breakdown" occurred, as you see, after the fiftieth year. Do not make the diagnosis of "nervous breakdown" in a person of fifty. One knows all sorts of tragedies arising because of diseases treated wrongly at fifty under that diagnosis.

The aching of the legs and hips does not sound like arthritis, since there was no heat or swelling. It sounds like something connected with the nervous system.

The old pelvic operation ought I think to be significant in this case. Most of her symptoms might be explained by some pelvic lesion. Pains in both legs in an elderly person make us think of pelvic tumor. These pains are apparently not connected with the joints. We have also bladder symptoms such as might come from pelvic pressure. We have a history of a previous operation for something which might perfectly well have recurred in malignant form. So that malignant pelvic tumor is the thing most in my mind so far.

There are also some suggestions of a heart lesion, some dyspnea for several years. We do not expect pain in the legs from heart trouble. We expect edema, but not pain. Blurring of the vision I do not understand. It is not explained by anything that has come out so far.

NOTES ON THE PHYSICAL EXAMINATION

If these heart measurements are correct there is enlargement of the heart. The blood pressure of 170/90 increases the probability of enlargement of the heart.

We do not get much from the pelvic examination, but apparently the pelvic condition cannot have had much to do with death.

We are brought back again to consideration of the leg joints by the limitation of motion in the hips and knees. We must consider arthritis as perhaps the cause of the pain. Then we might look to the heart as the cause of death.

Heberden's nodes are of no importance one way or the other. Half the old people you see have them. It is often a harmless condition.

The specific gravity of the urine shows that the kidneys had good power of concentration. These were catheterized specimens, so we can rule out leukocytes from the vagina. The renal function of 25 per cent is excellent, of course. The slight trace of sugar I should not think was of any importance.

The non-protein nitrogen was normal the first time, distinctly abnormal and high at the later examinations.

DR. GEORGE W. HOLMES: I think the films of the spine and the knees are characteristic of arthritis. You can see bridges forming between the vertebrae along the anterior margin of the spine. There is some bowing of the spine such as we sometimes get in old people. The hip joint shows some irregularity characteristic of an old hypertrophic type of arthritis.

The chest films show perfectly normal lung fields. There is a prominent aortic knob and a tortuous aorta, as you would expect in a person of that age. The dome of the diaphragm is high on both sides. This would increase the size of the heart shadow if anything. The heart measurements are within normal limits. I doubt very much if there is any enlargement.

DR. CABOT: Did you say anthing about the picture of the knees? I do not know enough to say if there is anything wrong with them.

DR. HOLMES: The shadows that you see are the sesamoid bones, of no importance. The joint spaces are a little narrow and the space between the patella and the joint is narrow. There is a tendency to spur formation. On the spines of the tibiae they are a little higher than usual.

DR. CABOT: This patient had a great deal of pain in both legs and hips. Do you find plenty of evidence here to account for the pain in the legs?

DR. HOLMES: I think a hip like that is rather apt to be painful.

DR. CABOT: So far I have not seen anything that this patient can have died of. Certainly she cannot have died of anything Dr. Holmes has demonstrated. The heart does not seem much diseased, although there is edema of the legs. I do not know yet what the cause of death will prove to be.

Do people get drowsy from anything that has been revealed so far? Of course that high non-protein nitrogen begins to come into our minds now. I wonder if we have given enough attention to the kidneys.

We have been told nothing about an extreme

hypertension, and there is nothing to make us think of it. Nobody ever would do venesection for a blood pressure of 170. It must have been higher than that.

I do not believe the condition of the left pupil was due to homatropin. It must have been something else.

DIFFERENTIAL DIAGNOSIS

This is a queer case. She did not come into the hospital at all in a mood to die. Nobody thought she was going to die for a long time. There was a low non-protein nitrogen, no leukocytosis. Something happened to her after she came into the hospital apparently. The only thing definitely indicated as suspicious is the kidneys. But why should the kidneys go wrong after she came here? Late in her life there was albumin and a high non-protein nitrogen. There was a high blood pressure, stupor, and a dilated pupil which might be due to that. These are all that I think of. There was tenderness in the left lower quadrant of which I cannot make anything in particular. There was a high leukocyte count. If that is not a uremic leukocytosis I do not know what else to call it. But why a patient who had such good kidney function when she came into the hospital should die of kidney disease I do not see.

A STUDENT: What is a good kidney function?

DR. CABOT: 25; 15 is a good function. 10 is not a very satisfactory function. Any percentage below 10 is not satisfactory. What I am speaking of is function as referred to kidney trouble. I have seen here a number of times a function of 10 with normal kidneys (post mortem) acting poorly because of passive congestion. When we are thinking of function as an index of nephritis we have to look for very low figures.

A STUDENT: Do you rule out diabetes entirely?

DR. CABOT: Yes, I think we ought to rule it out. There is only a trace of sugar and no polyuria. Even though she was obese, I do not think she died of diabetes.

A STUDENT: Would x-ray have thrown any light on the question of pelvic tumor?

DR. HOLMES: No.

A STUDENT: What about the leukocytes in the urine?

DR. CABOT: I do not know. In women of her age we often find them with no known cause.

A STUDENT: How about the marked frequency?

DR. CABOT: I do not know what to say about that.

A STUDENT: The blood shows a leukocytosis. What does that mean?

DR. CABOT: I suppose infection. That would mean to me that something queer happened after she got here. She came here with normal blood and urine.

MISS PAINTER: The leukocyte count was 6,800 at entrance, went up to 44,000 September 30 and came down October 1 to 27,900.

DR. CABOT: It rose practically continuously after the first count. We can get leukocytosis from uremia. On the other hand we do not expect such a high count as that from uremia alone.

A STUDENT: Could the lumbar vertebrae press on the cord and cause symptoms in the bladder?

DR. CABOT: I should say no. Dr. Holmes, what do you say?

DR. HOLMES: No.

A STUDENT: Could it be cerebral hemorrhage?

DR. CABOT: I should say it is not at all probable. I am always very slow to make the diagnosis of cerebral hemorrhage without paralysis. It would not account for all the facts. Cerebral hemorrhage does not cause high non-protein nitrogen. Moreover the lumbar puncture was negative, which is against cerebral hemorrhage. Most of them communicate with the spinal canal.

A STUDENT: Was this non-protein nitrogen high enough to indicate a fatal uremia?

DR. CABOT: No, though you can get fatal uremia with a count no higher than that. It is not particularly high.

A STUDENT: Could you get any of these uremic symptoms merely from failing heart?

DR. CABOT: No. I am willing to say that positively.

A STUDENT: Could she have died of pneumonia without any signs?

DR. CABOT: No, not with this picture, not with coma coming so early.

I cannot make a diagnosis in this case. I hate not to commit myself. But I do not think I have enough data.

A STUDENT: Does the x-ray look like infectious arthritis?

DR. CABOT: I should not say so.

DR. HOLMES: She may have had some infectious arthritis in addition to the hypertrophic. It would be unusual for hypertrophic arthritis alone to produce as much destruction of the hip joint as you see in these films. Ordinarily infectious arthritis does not show what you see here. I should think she had the so-called hypertrophic arthritis and possibly some infection in the hip.

A STUDENT: What would account for the blood she noticed five or six times?

DR. CABOT: That may have been due to hemorrhoids.

What was the clinical diagnosis made before the autopsy?

DR. TRACY B. MALLORY: Arthritis, cystitis, hypertension, possible malignancy of the sigmoid, cerebral hemorrhage.

DR. CABOT: They made a diagnosis of cerebral hemorrhage and I cannot exclude it. But I think it is a queer diagnosis.

X-RAY INTERPRETATION

The findings are consistent with hypertrophic arthritis.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Arthritis.
Cystitis.
Hypertension.
Arteriosclerosis.
Cerebral hemorrhage.

DR. RICHARD C. CABOT'S DIAGNOSIS

Not made.

ANATOMIC DIAGNOSES

Arteriosclerosis.
Pyelonephritis.
Hypertrophic arthritis.

PATHOLOGIC DISCUSSION

DR. MALLORY: I am not sure I can explain much more. She had only a few positive findings. One was a marked hypertrophic arthritis. We found a series of small abscesses in the kidney accompanied by a moderate degree of infection of the kidneys, cortex, pelvis, ureters and the bladder itself,—pyelonephritis. It did not look like a very severe lesion and I should not think it could have been the chief cause of death. It could not have produced a fatal degree of uremia. One other really marked finding was the extreme degree of arteriosclerosis. The vessels were extremely narrow and calcified. On the other hand very careful sectioning of the brain failed to show any areas of softening and hemorrhage.

DR. CABOT: We really do not know the cause of death, do you think?

DR. MALLORY: No, I certainly cannot give any single cause. I have the impression that I have seen cerebral arteriosclerosis cause death without any localized hemorrhage or softening. At any rate in occasional cases showing this no other significant cause of death is found.

A STUDENT: Was a blood culture done?

DR. MALLORY: No.

A STUDENT: What did the kidney tissue look like?

DR. MALLORY: Except for evidence of pyelonephritis it was negative.

DR. CABOT: It was a functioning kidney so far as you could see?

DR. MALLORY: Yes.

A STUDENT: How about the pancreas?

DR. MALLORY: Negative.

A STUDENT: Does the clinical record say what the blood pressure was when venesection was done?

MISS PAINTER: It is not recorded. It was 175 two days later.

DR. CABOT: I should not think the loss of 500 cubic centimeters of blood would kill her.

A STUDENT: What was the size of the heart?

DR. MALLORY: The heart was normal in size.

A STUDENT: It was enlarged to percussion.

DR. CABOT: The heart's function was apparently good.

A STUDENT: There was a little edema of the legs.

DR. CABOT: Yes. But she was a fat woman. Many fat people have edema of the legs.

A STUDENT: Could she have died of diabetes?

DR. CABOT: I do not believe it.

I always feel that in post-mortems our records ought occasionally to contain the words *"Causa mortis ignota."* We have to say that these necropsy findings are not enough. I understand Dr. Mallory does not feel that the facts we have are enough to account for the death.

CASE 16522

A CASE OF CARCINOMA OF THE ESOPHAGUS WITH TRACHEAL-ESOPHAGEAL FISTULA

SURGICAL DEPARTMENT

PRESENTATION OF CASE

DR. RICHARD W. DWIGHT:* This patient was a seventy-one year old man who first came to the Eye and Ear Infirmary in September, 1929. He complained of difficulty in swallowing food which came on suddenly four months previously. He was able to get some food down. He had lost forty-three pounds. X-ray examination with barium by mouth showed almost complete obstruction of the esophagus. Esophagoscopy showed the lumen of the middle third of the esophagus to be rather fixed and the surface roughened. The stricture was dilated with flexible bougies and four gold seeds were inserted. He was discharged much improved. Biopsy showed carcinoma group II or III.

One year later, in October, 1930, he returned to the Eye and Ear Infirmary. He had been very much improved, completely free from any symptoms until six weeks before. Then he suddenly became very hoarse. Four weeks before the second entry he again had difficulty in swallowing and for six days was unable to take any food or liquids. Laryngeal examination showed inability to abduct the cords. X-ray with barium by mouth showed an esophageal-bronchial fistula. He was seen in consultation and transferred to the surgical service for operation.

Physical examination showed an emaciated, markedly dehydrated old man who could speak only in a hoarse whisper. There was general arteriosclerosis. The heart was normal in size. The sounds were almost inaudible. No murmurs were heard. There was a small area of dullness in the right chest about at the angle of the scapula. The other signs were not remarkable

*Junior interne on the West Surgical service.

except for occasional squeaks at the right base. The left chest was apparently clear. He was given clysis and had operation the next day. Gastrostomy under local anesthesia was performed, with double purse string suture around the catheter. Two days later he seemed to be in good condition, and took tube feedings fairly well. He was running a temperature of 100° to 101°. On the third day after the operation he started vomiting the feedings which were given through the gastrostomy tube. From that time he vomited everything given through that tube. He had to have frequent hypodermoclyses and intravenous glucose. On the third day he also showed signs in the chest, râles and dullness, increasing rapidly until there were signs of massive bronchopneumonia on both sides. X-ray showed mottled dullness in the region of both lower lobes, more confluent and dense on the left side. The diaphragm was not seen on the left. The heart was not displaced. The impression was that there was consolidation in both lower lobes. The patient went downhill very rapidly, became irrational five days after the operation, and eight days after the operation died.

Clinical Discussion

Dr. E. Parker Hayden: I saw this man in the Eye and Ear Infirmary and decided on a gastrostomy. He had reached a point of almost complete obstruction. There was nothing unusual about the operation that I recollect. The stomach was very much contracted. As I remember it, the stomach was so small that it looked like the large intestine. Of course at his age operation would ordinarily not be considered. People who show carcinoma group III have a very slim chance of living. A radical resection would have been entirely out of the question. There are only one or possibly two cases on record in which cancer of the esophagus has been removed successfully.

I think that is about the whole story. With tracheal-esophageal fistula I think he was a good candidate for pneumonia. A man seventy-two years old with an upper abdominal operation would be a good candidate had that not existed.

Clinical diagnosis (from hospital record)

Carcinoma of the esophagus.

Anatomic diagnoses

Carcinoma of the esophagus with metastases to the stomach.
Tracheal-esophageal fistula.
Lobar pneumonia.
Acute endocarditis.

Pathologic Discussion

Dr. Tracy B. Mallory: Autopsy showed only two things out of the ordinary. One was of course the tracheal-esophageal fistula. We do not see that very often, at least in this hospital, though it is not rare as a terminal event in esophageal malignancy. The pneumonia which developed was apparently a perfectly typical lobar pneumonia, something of a surprise, for one would rather have expected him to develop a pulmonary abscess. Would that be your impression, Dr. Holmes?

Dr. George W. Holmes: Yes.

Dr. Mallory: There were metastases from the esophageal cancer to the stomach just below the cardia. Here is the esophagus, which I can open only with difficulty. The lumen is not greater than the diameter of a lead pencil. The tumor is at the level of the bifurcation of the bronchi. The esophagus is slightly dilated above it, below it normal except for leukoplakia, a very common finding in the esophagus and possibly of significance as a precancerous lesion. Just beyond the cardia are several small raised nodules in the stomach wall. The mucous membrane over them is not ulcerated, which is fairly good evidence that they were not primary in that region. Primary tumors there would of course be adenocarcinomas, and these nodules show squamous cell carcinoma like the esophageal mass. But they are close enough to the cardia so that I think it is possible that some of his obstruction may have been due to them rather than to the primary tumor higher up. It seemed to me as though the history was a little peculiar. He could not take food by mouth, but he vomited by mouth what was given below. Isn't that out of the ordinary?

Dr. Edward C. Churchill: He may have been able to exert more pressure coming up than going down.

Dr. Holmes: Usually in the intestinal tract an object will move on the normal direction better than in the other direction.

A Physician: Through his bronchial fistula?

Dr. Mallory: He vomited it out through the mouth, I take it.

Dr. Dwight: Yes.

Dr. Mallory: It is possible that cardiospasm may have been one of the main causes of obstruction in this case. It has often been reported with tumors near the cardia.

Incidentally this man had an acute endocarditis. A rather surprising number of our cancer cases in the past few months have shown acute endocarditis which has been unsuspected clinically.

A Physician: What relation is there between the application of radium and the esophageal-bronchial fistula?

Dr. Mallory: I think it is impossible to say. It could have occurred without the radium.

Dr. Edwards W. Herman: There is a question of the use of radium. A number of years ago I looked up a series of cases treated with radium. The average duration of life following the implantation was about three months.

It did not seem on the average to improve matters whether they had gastrostomy or radium treatment. There were enough calamities to average up the few cases whose lives were prolonged. Then there came a period when instead of trying to give destructive doses of radiation we did what was done in this case in 1929. After removing a section for diagnosis and putting in a small bougie we placed four seeds close around it, so that a certain amount of necrosis in that region would allow the patient to swallow better and thus avoid a gastrostomy. In this case it prolonged his life many months; but the case ended up with gastrostomy.

Dr. Holmes has recently treated some cases more radically than before, and we may be getting better results. A case treated recently swallows normally and does not vomit, but has had so much nausea following this treatment that he says he would rather have died in three months' time than live three years in his present condition.

DR. HOLMES: I remember the patient very well, and I do not understand why he is nauseated. He did not have enough radiation for that. That man is one of the patients who were told definitely what the trouble was. He is thoroughly convinced that he has cancer. He took it very well at first. Then he went all to pieces. I think there is a psychological side to the nausea. He was treated over the chest wall above the abdomen, and there is no reason why he should be nauseated.

The New England
Journal of Medicine

SUCCESSOR TO
THE BOSTON MEDICAL AND SURGICAL JOURNAL

Established in 1828

Published by THE MASSACHUSETTS MEDICAL SOCIETY under the jurisdiction of the

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Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the Journal office, 165 Newbury Street.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The New England Journal of Medicine, 165 Newbury Street, Boston, Mass.

WARNING TO PHYSICIANS

MOST of the physicians of the State, registered under the Harrison Narcotic Law, have no doubt by this time received their warning notice relative to re-registration and payment of special tax on or before July 1 of each year.

We trust that all have given due consideration to the second paragraph and have correctly interpreted its significance. "Section 9 of the Harrison Narcotic Law provides that anyone who violates *or fails to comply with any of the above requirements* shall, on conviction, be fined not more than $2,000.00 or be imprisoned not more than five years, or both, in the discretion of the court."

The medical profession, it will be seen, under a law of the land of the free and the home of the brave, constitutes a privileged class. It is privileged to prescribe narcotics on the payment of a special tax which allows it to assume the privilege of bearing the financial burden of narcotic control; its members are given the privilege of languishing in jail, fortunately for a period of not more than five years, if by a simple error of omission they should fail to fulfill an imposed obligation on a certain date.

Perhaps the court, in its infinite mercy, might not impose the extreme penalty; perhaps inconvenience, indignity and humiliation might be the only penalty involved in a given instance; nevertheless the specific penalty is provided by law and to no one is it guaranteed that he will not suffer it if he innocently fails to fulfill the requirements.

Here, if ever there was one, is a wrong which needs to be righted. Here is an instance of legislation gone awry. A learned profession, a profession which ministers to the needs of others, a profession which has little interest in or aptitude for practical politics must suffer from discriminatory legislation of the less intelligent sort. How long must this continue?

A PROSPECTIVE CLASSIFICATION OF DISEASES

AT a recent meeting of the National Conference on Nomenclature of Disease at the New York Academy of Medicine, plans were formulated for a new basis for the classification nomenclature of all diseases according to a common pattern.

The long and complicated list will be abbreviated to meet the wishes of special medical groups.

The report by the conference emphasizes the simplicity, logical arrangement and applicability to the recording of diseases by institutions and officials.

The recommendations will be submitted to clinical groups representing the different specialties and the conclusions will be assembled into one nomenclature and will be given to certain selected hospitals for trial with the hope that it will become a national standard.

Dr. Haven Emerson is the President of the conference with Dr. Henry Christian, Vice-President, and Dr. Lewinski Corwin, Secretary.

If the final conclusions are made a national standard, great advantages will accrue in a clearer understanding of mortality statistics.

THE HIGH COST OF FUNERALS

ALTHOUGH for some time it has been felt by social workers and others that there is in certain cases considerable maladjustment between the cost of burial and the financial resources of surviving members of the family, it is only recently that the problem has been carefully and impartially analyzed. A recent contribution from the Committee on the Costs of Medical Care[1] summarizes the result of a burial survey in New York. The average cost of burial for 7,871 adult industrial policyholders of the Metropolitan Life Insurance Company came to $363. In Massachusetts the average cost was $422, exceed-

ing the average amount of insurance carried by nearly 15%.

One of the most striking of the facts brought out in this contribution is the uneven distribution of funeral business among the various undertaking establishments. For example, in New York City 8% of the undertakers handled 44% of the business, leaving an average of about two funerals per month for the remaining 92%. By and large, the smaller the establishment the larger its costs must be owing to the overhead involved.

As is pointed out in this contribution, there has been very little weeding out of the uneconomic smaller establishments and the problem of their survival has been met by education of the public taste for more expensive merchandise, together with more elaborate funerals. The rôle played by more expensive merchandise is well illustrated by the trade practices in the casket industry. Showrooms are not infrequently maintained by the casket manufacturers where the family can be brought by the undertaker, who often carries no stock of his own. The price on the casket is set as a rule to carry the cost of the various services performed. The practice by some of the manufacturers is to mark up the price from 300% to 500%, which suffices to provide a good profit on the funeral for the undertaker.

The report concludes that excessive funeral expenditures are due on the one hand to desire on the part of the family for an elaborate funeral, behind which varying motives may lie, and on the other hand to the disorganization and uneconomic processes prevailing in the undertaking business. As a rule high charges by undertakers do not indicate so much exorbitant profit as they do an attempt to make a living from an inadequate volume of business.

REFERENCE

1 Gebhart, J. C.: Funeral Costs. Contribution No. 3. Committee on the Costs of Medical Care.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

MASON, ROBERT L. A.B., M.D. Harvard 1922. F.A.C.S. Formerly Surgeon, Lahey Clinic. Address: Council Bluffs Clinic, Council Bluffs, Iowa. Associated with him is:

HUNT, HAZEL M. A.B. Vassar 1918. Director of the Chemical Laboratory at the New England Deaconess Hospital. Address: New England Deaconess Hospital, Boston. And

HURXTHAL, LEWIS. M.D. Harvard 1923. Charge of Medical Department, Lahey Clinic. Address: 605 Commonwealth Avenue, Boston. Their subject is: "Blood Cholesterol Values in Hyperthyroidism and Hypothyroidism.—Their Significance." Page 1273.

GARLAND, JOSEPH. A.B., M.D. Harvard 1919. Physician to the Children's Medical Department, Massachusetts General Hospital. Instructor in Pediatrics, Harvard Medical School. Consulting Pediatrician, Massachusetts Eye and Ear Infirmary. Consulting Pediatrician, New England Baptist Hospital. Address: 264 Beacon Street, Boston. Associated with him is:

RICH, MABEL B. R.N., Social Service, Children's Medical Department, Massachusetts General Hospital. Their subject is: "Duration of Breast Feeding: A Comparative Study." Page 1279.

BUCK, ROBERT W. A.B., A.M., M.D. Harvard 1921. Associate Chief of Medical Service, Boston Dispensary 1926-. Instructor in Medicine, Tufts College Medical School. Address: 270 Commonwealth Avenue, Boston. Associated with him is:

PROGER, SAMUEL H. B.S., M.D. Emory, 1927. Assistant in Medicine, Boston Dispensary. Address: Medical Clinic, University of Heidelberg, Germany. Their subject is: "The Dilution and Concentration Test of Renal Function: Comparison of Results with Other Tests in One Hundred Cases." Page 1283.

STEWART, JOHN D. A.B., M.D. Harvard 1928. Surgical House Officer, Massachusetts General Hospital. His subject is: "Diverticulosis of the Appendix." Page 1288. Address: Massachusetts General Hospital, Boston.

RICE, ALLEN G. A.B., M.D. Harvard 1905. F.A.C.S. Visiting Surgeon to Springfield Hospital, Springfield, Mass. Address: 33 School Street, Springfield, Mass. Associated with him is:

CORLISS, PHILIP G. M.D. Harvard 1930. House Officer, Springfield Hospital, Springfield, Mass. Address: 759 Chestnut Street, Springfield. Their subject is: "An Unusual Case of Osteomyelitis in an Infant." Page 1290.

LEAVITT, PEIRCE H. B.S., M.D. Harvard 1914. F.A.C.S. Surgeon, Goddard Hospital, Brockton. His subject is: "Importance of Routine Bacterial Examinations in Laparotomies Based on a Case Report." Page 1291. Address: 129 W. Elm Street, Brockton, Mass.

The Massachusetts Medical Society

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What is the significance of increased bleeding at time of the menopause?

By increased uterine bleeding is meant one of two things: (1) any increase in frequency, duration, or amount of the menstrual flow over the normal established habit of the individual; or (2) any intermenstrual or non-periodic bleed-

ing, however scanty. These are abnormal phenomena, which always demand investigation and usually require treatment.

CAUSES OF INCREASED MENOPAUSAL BLEEDING

Rarities being excluded, the causes of increased bleeding at the menopause fall into three groups: (1) abnormal pregnancy; (2) neoplasms; and (3) functional disturbance.

Abnormal Pregnancy. Conception at or near the menopause, perhaps after years of sterility, is not rare. Hence it should be borne in mind that uterine bleeding may come from any of the abnormalities of early pregnancy—ectopic gestation, threatened or incomplete miscarriage, mole, and postabortal subinvolution.

Neoplasms. The common benign neoplasms of the uterus are fibromyoma and polypus; the malignant ones are cervical cancer, corporeal cancer, and sarcoma. In all of these, bleeding is a usual symptom. While carcinoma is not the most frequent cause of abnormal flowing, it is by all odds the most serious and hence deserves special emphasis.

Functional Disturbance. In the non-pregnant non-neoplastic group are included numerous causes of uterine bleeding, apparently most diverse in character. Among these are local conditions such as chronic passive congestion, pelvic inflammation, hyperplasia of the endometrium, fixed retrodisplacement, prolapse of the ovaries, and ovarian tumors; also various constitutional conditions, in particular circulatory disturbances like arterial hypertension and the venous congestion resulting from cardiac decompensation, and endocrine disturbances like underfunction of the ovary, unbalanced function of the pituitary, and either underfunction or overfunction of the thyroid.

The improved modern knowledge of the physiology of menstruation makes clear that in all of these different conditions the increased bleeding is produced by essentially the same final mechanism, namely, interference with normal ovulation. If the ovaries labor under any sort of difficulty, circulatory, mechanical, or endocrine, the result may be incomplete maturation of follicles and absence of normal corpora lutea. In consequence there is an excessive endometrial response, which shows itself as increased flowing and in some cases as actual hyperplasia of the endometrium.

INVESTIGATION AND TREATMENT OF MENOPAUSAL BLEEDING

A multiparous woman of 45 presents herself with the complaint that for several months her periods, previously regular and normal, have been excessive both in duration and in amount. What is the proper clinical procedure?

First of all, the patient should receive a general physical examination and a careful abdominopelvic examination, including speculum-examination of the cervix. This investigation may or may not disclose adequate cause for the bleeding. If it does, then the condition discovered should be treated according to accepted methods. A cessation of abnormal flowing is proof that both the diagnosis and the treatment are correct.

On the other hand, the most careful examination may fail to show any gross structural pathology. In such cases one of two situations exists. First, there may be structural pathology not detectable by the examining fingers: in particular, small neoplasms within the uterus. Second, the bleeding may be the result of faulty ovarian function, a manifestation of natural senescence on the part of the ovaries.

It is probably safest to lay down as a working rule that *every* menopausal woman who flows abnormally without obvious cause should be subjected to dilatation and curettage. This procedure is primarily diagnostic, serving to establish or rule out the presence of intrauterine neoplasms. It may also be to some extent therapeutic, especially when hyperplasia of the endometrium is an item in the picture.

When every diagnostic method, including curettage, has excluded anatomic pathology, then (and only then) the bleeding may be regarded as the "essential" or "idiopathic" haemorrhage of the menopause, due to the inadequate functioning of senescent ovaries. Treatment in the ordinary case consists of long hot douches to stabilize the pelvic circulation, and injection of the so-called follicular hormone to control the endometrial response by replacing deficient ovarian secretion. If bleeding is excessive, more drastic measures may be required. Hysterectomy was formerly in vogue, but has been entirely replaced in cases of this type by radiotherapy, which is practically a specific.

Finally, it should be again emphasized that the practitioner assumes a heavy responsibility in dealing with menopausal bleeding. His duty is always to regard the case as potentially one of cancer, until he has conclusively demonstrated the contrary.

POSTMENOPAUSAL BLEEDING

Any bleeding, even the slightest spotting or staining, which occurs after an established menopause, is a conspicuous danger-signal. Here there is no possibility of a functional cause. Postmenopausal bleeding results from three conditions: polypus, senile ulceration, and malignant neoplasm. In more than sixty per cent. of such cases the cause is cancer.

Questions of a similar nature to the above will be discussed in the *Journal* each week. They may be addressed to the Clerk of the Committee in care of the *Journal* and will be answered by members of the Committee of the Section of Obstetrics and Gynecology.

THE BOSTON MEDICAL LIBRARY

BENJAMIN RUSH, M.D.

1745-1813

THE success of many an adventure is dependent very largely upon the personnel of its promoters. Associated with the beginnings of the first successful attempt at organized medical teaching in this country were the names of a number of individuals who would have brought distinction to any endeavor. Most prominent among these was that of Benjamin Rush. His ancestry was not of the aristocratic stock which was conspicuous in the settlement of Pennsylvania but rather of a plebeian strain. His immigrant ancestor, John Rush, a Captain under Cromwell, came over to Penn's Colony in 1683. He settled in Byberry, 13 miles from Philadelphia. There, including the immigrant John, four generations of them had lived and prospered as farmers before Benjamin was born, on December 24, 1745. Very little is known of his early life except that he left the place of his birth when he was six, probably occasioned by the death of his father. The family removed to Philadelphia where his mother opened a shop. Among his mother's relations was the Rev. Dr. Finley who conducted a very well known Academy at Nottingham in Southern Maryland. When Rush was nine years of age he went to Nottingham where he passed the next five years of his life, profiting by the exceptionally good instruction which he received under Dr. Finley, who appears to have been much sought as a tutor in those days, for a number of prominent men have acknowledged their indebtedness to him both before and after he became president of Princeton College. Like so many who received their schooling in that period he became a good Greek and Latin scholar, so good a one that the classics were always a solace to him. At fourteen he entered Princeton where the curriculum differed so little from that which he had been brought up on by Dr. Finley that he needed only a year at Princeton before he secured his Bachelor of Arts, at the commencement of 1760. It was not uncommon at this period to meet with precocity of this sort. In England Pitt and Fox were directors of political thought at an early age. Washington was a leader among men at 19 and Alexander Hamilton had become a constructive statesman by the time he was 32. When he left college he was in the dark as to what calling he would adopt and again it was Dr. Finley who helped him to make his decision for medicine. He was started on this career at the age of 15 in the office of Dr. Redman of Philadelphia, one of the most prominent physicians of that city. Fox six years he applied himself faithfully to his apprenticeship, being absent for only two days; he amused himself by translating Hippocrates and started a double entry record book which he kept all his life. In one column of this he entered observed facts and in the other comments or reflections upon his observations. In the year 1766, when he was 21, he went to Europe and spent two years at the University of Edinburgh where he became a prime favorite with Cullen who then was a conspicuous teacher at that famous institution. He secured his Doctor's degree there in 1768. From Edinburgh he went first to London for a time where he visited the Hospitals and followed certain postgraduate courses. Franklin was there and through him Rush was introduced to many worth while people and was persuaded to visit Paris where he studied Medicine and French. He returned to Philadelphia in 1769. From that time to the end of his life he took no further recreation, for his mind and temperament were such that he must always be occupied with something productive. He came back to his native city with an entreé to the best professional life of the place, being already acquainted with Morgan, Shippen, Redman and Kuhn. He was almost immediately made Professor of Chemistry at the college of Philadelphia. It is probable that his knowledge of chemistry was not so very profound but he was a very inspiring teacher and his lectures are very good reading. They were revised each year and always delivered with enthusiasm so that his pupils went out from under his instruction with high ideals of scholarship, industry and the dignity of the profession upon which they had entered. In the few years that preceded the outbreak of the Revolutionary War Rush busied himself with teaching and building up a practice. In doing this he employed methods for getting himself in the public eye which were proper enough in his day but would be looked at somewhat askance now. He was profoundly concerned over the impending break with the mother country and when it did come aligned himself, whole heartedly, with the colonists. He supported the cause by writing, speaking, serving two terms in Congress, signing the Declaration of Independence and enlisting in the medical corps of the army for more than a year, during which time he came to some disagreement with General Washington in consequence of which he resigned. The circumstances under which this came about, occurring as it did during the period of deep depression caused by the hardships of Valley Forge, do not put him in too good a light, but probably he was actuated by motives that seemed to him proper. To read of the public matters that received his personal support, and for which he strove in every way he could, reveals the broad scope of his humanitarian interests. He advocated setting free all slaves, was opposed to capital punishment, believed in the higher education of women, suggested a reformation in educational methods looking to the abolition of the classical system and urged some form of arbitration in place of war, as a means of settling international dis-

putes. To this end he would have had, as a cabinet officer, a Secretary of State for Peace. On his return to Philadelphia from his military service he resumed his teaching and his practice. The war had stopped all medical school activities but in 1778 the medical courses were resumed, for a class of 60. Shortly after this the charter of the college was temporarily revoked and the University of the State of Pennsylvania was established. On the death of Morgan in 1779, Rush was put in his place as Professor of the Theory and Practice of Medicine in the restored school. In 1791 the two schools were united and he was then given the chair of the Institutes of Medicine and Clinical Medicine, in addition to his other position. From 1805 until his death he carried the burden of three professorships, Chemistry, the Institutes and Theory and Practice. In addition to these duties he was responsible for a Hospital service at the Pennsylvania Hospital, carried on a large practice which he did not neglect, was called frequently in consultation at a distance and was active with his pen and on public rostra in the advocacy of the many causes in which he was interested, outside the pale of medicine. His family responsibilities were considerable for he married early, at the very beginning of the War, and there were thirteen children to care for. He was greatly interested in mental diseases and up to 1883 there was no work in this country on psychiatry to be compared to that which he had taught and written. The prevalence of yellow fever in 1793 gave him an opportunity for the study of this epidemic. He availed himself of this to the full and wrote an exhaustive article on the subject, which is a classic. It was translated into three languages. His success in practice and his contention that yellow fever was not an imported disease but rather one arising from local, spontaneous causes, won for him many enemies. His published writings give a good idea of the breadth and extent of his interests. Among them are communications on infectious diseases, malaria, influenza, hydrophobia, free public education, the study of the classics as a part of a liberal education, information to Europeans immigrating to this country and the influence of physical causes on the Moral Faculty. He also edited the works of Sydenham and Pringle's "Diseases of the Army." He held membership in practically all the noteworthy societies in this country, was given an LL.D., by Yale College, was honored with election to several foreign societies and was the recipient of numerous gifts from foreign rulers in recognition of his services in respect to yellow fever. He held the position of treasurer of the U. S. Mint from 1799 to his death, at which time the office was passed on to his son, in his honor. After an illness of four days, which was probably pneumonia, he died on April 19, 1813.

One is reminded in reviewing the accomplishments of such a life as that of Benjamin Rush of certain comments recently made by Dr. E. Graham in an address to a class graduating in Medicine from the University of London, in which he said, "It is all to the good that the horizon of one's mind should be widened, for the man who has no hobby but his work cannot make the best even of that work: narrow channels are seldom deep. It is the glory of our training that it is so wide, that it fits a man to do most things in life; too often, however, the exacting claims of practice when he becomes qualified, mop up all his energies and I would plead with my hearers to be on their guard betimes against this narrowing outlook. And so I advise you to keep alive an eager interest in the great issues of the day, when possible take a part in moulding them. You will be all the better doctors for being widely cultivated persons, concerned with many things besides medicine. The school which produced Thomas Young, perhaps the most versatile genius that has ever adorned medicine, takes you to its bosom today; and if you follow and live up to its traditions, you cannot fail to become admirable doctors, and what is even more important, admirable citizens of the world."

MISCELLANY

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS

NOVEMBER, 1930

The total number of communicable diseases reported in Massachusetts for November is not unduly high, and about 300 lower than that reported last year. The total is 5693.

Anterior Poliomyelitis shows the customary seasonal decline, a total of 51 cases having been reported as against 170 in October. The epidemic this year has been somewhat more severe than in previous years, but not equal to the totals in 1927 and 1920.

Only 268 cases of Diphtheria were reported in November of this year, somewhat less than half the number reported last year, and a new low figure for November.

Cerebrospinal Meningitis continues relatively low with only 6 cases for the past month.

Influenza has likewise been reported only 13 times as against the usual 30 or 40 for November.

Thirty-eight cases of Typhoid were reported in November; this is about the average figure for this season of the year.

Five hundred fifty-nine cases of Measles were reported; about 150 more than for November of last year, but still not unduly many for this time of the year.

Barely half of the customary number of cases of Mumps were reported for November, but this figure, none the less, shows the beginning of the seasonal rise in the prevalence of that disease.

Chicken Pox, Whooping Cough, Scarlet Fever, and German Measles show about the usual figures for the month, as do Pulmonary and other forms of Tuberculosis.

Gonorrhea and Syphilis continue to show an increase over last year.

RARE DISEASES

Actinomycosis was reported from North Reading, 1.

Anterior Poliomyelitis was reported from Belmont, 2; Boston, 16; Cambridge, 7; Dedham, 2; Fitchburg, 2; Hanover, 1; Ipswich, 2; Leominster, 1; Lowell, 2; Medford, 1; Newton, 3; Plymouth, 2; Somerville, 1; Sterling, 1; Stow, 2; Watertown, 1; Worcester, 5; total, 51.

Dysentery was reported from Concord, 1.

Encephalitis Lethargica was reported from Athol, 1; Boston, 2; Brookline, 1; Cambridge, 1; Everett, 1; Haverhill, 1; total, 7.

Epidemic Cerebrospinal Meningitis was reported from Boston, 1; Brookline, 1; Fall River, 1; Gloucester, 1; Melrose, 1; Worcester, 1; total, 6.

Malaria was reported from Boston, 2; Chelsea, 3; total, 5.

Pellagra was reported from Boston, 1.

Septic Sore Throat was reported from Boston, 6; Cambridge, 1; Everett, 1; Lawrence, 4; Lowell, 1; Medford, 2; Melrose, 1; Milford, 1; Newton, 1; Swampscott, 1; total, 19.

Tetanus was reported from Medford, 1.

Trachoma was reported from Boston, 1.

Trichinosis was reported from Boston, 1; Cambridge, 1; total, 2.

MONTHLY REPORT OF CERTAIN COMMUNICABLE DISEASES

	Cases in Entire Pop.				Case Rates per 100,000 Pop.		
	Nov. 1930	Nov. 1929	Proso. Index*	Epi. Index†	Nov. 1920	Nov. 1929	Expected Rate‡
All Causes	5693	5958	—	—	133.8	140.7	—
Ant. Polio.	51	19	27	1.9	1.2	.4	.6
Diphtheria	268	556	490	.5	6.3	13.1	11.5
Ep. C. S. Men.	6	13	7	.9	.1	.3	.2
Measles	559	395	1390	.4	13.1	9.3	32.7
Pneu. Lobar	329	267	329	1.0	7.7	6.3	7.7
Scarlet Fever	677	874	1014	.7	15.9	20.6	23.8
Tbc. Pul.	366	353	341	1.1	8.6	8.3	8.0
Ty. Fever	38	22	24	1.6	.9	.5	.6
W. Cough	397	668	651	.6	9.3	15.8	15.3
Chicken Pox	1425	1306	—	—	33.5	30.8	—
German Measles	62	35	—	—	1.5	.8	—
Gonorrhea	528	335	—	—	12.4	7.9	—
Influenza	13	25	—	—	.3	.6	—
Mumps	184	409	—	—	4.3	9.7	—
Syphilis	309	110	—	—	7.3	2.6	—
TBC. O. Forms	41	53	—	—	1.0	1.3	—

*This index is an attempt to estimate the number of cases based on the trend during the past years which can be expected to occur, and is for the purpose of comparison with the number of cases which actually did occur.

†This ratio expresses how prevalent the disease is compared with the index mentioned above; 1.0 indicates that the actual number of cases equals the expected number. A larger number means a greater prevalence, and a smaller number a lesser prevalence than expected. Thus, 2.0 would indicate twice the expected number of cases, and .5 half the expected number of cases. The method used to determine the indices is described in the August 18, 1927 issue of the *Boston Medical and Surgical Journal*.

‡Calculated from the Prosodemic Index.

AN EXCERPT FROM THE BOOK REVIEW OF "*RIDERS OF THE PLAGUES*" IN *HEALTH NEWS*, PUBLISHED BY THE NEW YORK STATE DEPARTMENT OF HEALTH.

Dr. Samuel H. Durgin, health commissioner of Boston for nearly 40 years, is not mentioned at all. In fact his name and achievements in advancing public health seem to have been largely overlooked by historians in this field. Surely the man who put under control the virulent smallpox outbreak in the early '70's, which caused several thousand deaths in the city of Boston, who was one of the first to establish a plant in this country for the preparation of diphtheria antitoxin and the second to institute a city diagnostic laboratory, also the first to see the necessity of and to put into effect, a system of school medical inspection,—this man certainly deserves a place in the sun when it shines on those responsible for the development of modern methods of disease prevention and health preservation.

THE GOOD SAMARITAN HOSPITAL FUND

The drive for half a million dollars for the Good Samaritan Hospital is proceeding with gradual accessions to the fund.

The amounts pledged are in excess of one hundred and fifty thousand dollars.

Prominent physicians are assisting by addresses at luncheon meetings.

The existing business depression is the principal obstruction to the early realization of the plans of the committee.

AN EDUCATIONAL PLAN WITH RESPECT TO THE COSTS OF MEDICAL CARE

The committee in charge of the studies of the Costs of Medical Care are desirous of securing the widest publicity of its efforts to arrive at conclusions in connection with the problems incident to the cost of illness and have arranged to have speakers address meetings at which the subject will be given consideration.

Dr. Channing Frothingham will represent the Committee throughout New England and will accept invitations to speak before groups of physicians and others interested in the socialized and economic problems incident to dealing with sickness.

In making plans for such meetings Dr. Frothingham's availability as a speaker may be considered.

COMPARISON OF DISEASE INCIDENCE IN CONNECTICUT WITH 1929 AND SEVEN YEAR AVERAGE

MONTH ENDING DECEMBER 13, 1930

Diseases	1930 Week ending Nov. 22	1930 Week ending Nov. 29	1930 Week ending Dec. 6	1930 Week ending Dec. 13	Average cases reported for week corresponding to Dec. 13 for past seven years	1929 Week ending Nov. 23	1929 Week ending Nov. 30	1929 Week ending Dec. 7	1929 Week ending Dec. 14
Cerebrospinal Men.	2	1	4	3	2	—	—	1	9
Chickenpox	85	50	82	79	143	187	153	176	185
Conjunctivitis Inf.	—	—	—	—	1	5	2	—	1
Diphtheria	21	9	18	17	50	20	25	25	27
Encephalitis Epid.	—	—	—	1	—	—	—	—	—
German Measles	6	4	4	6	14	7	2	5	10
Influenza	3	3	1	1	4	2	1	3	4
Measles	91	85	89	105	101	4	2	9	5
Mumps	36	51	67	49	44	14	21	39	42
Paratyphoid Fever	1	—	—	—	—	2	—	—	—
Pneumonia (Broncho)*	18	12	16	13	27	11	6	18	18
Pneumonia (Lobar)	23	21	37	32	41	15	29	20	43
Poliomyelitis	1	—	1	—	1	—	—	—	—
Scarlet Fever	38	36	57	59	92	45	52	66	83
Septic Sore Throat	4	1	—	2	9	2	2	2	—
Tetanus	—	—	1	—	—	—	—	—	—
Trachoma	—	—	—	—	—	—	1	—	—
Trichinosis	—	—	—	—	—	—	—	—	1
Tuberculosis (Pul.)	22	21	26	29	25	37	31	21	15
Tuberculosis (O. F.)	1	1	3	1	1	—	3	3	1
Typhoid Fever	4	3	8	5	3	5	3	4	1
Undulant Fever†	—	2	3	3	—	1	—	—	—
Whooping Cough	23	38	87	25	51	59	36	51	46
Gonorrhea	40	27	62	20	25	35	28	86	41
Syphilis	40	35	88	38	28	28	41	78	59

Remarks: No cases of Asiatic cholera, glanders, plague and yellow fever during the past seven years.

*Made reportable January 1, 1925.
†Made reportable July 1, 1928.

SPECIAL FEATURES FOR THE ANNUAL MEETING OF THE NATIONAL TUBERCULOSIS ASSOCIATION AT SYRACUSE

In addition to the usual reports of the Executive Office, the President's Address, and other business usually transacted at the opening general meeting, the Committee on Program for the Twenty-seventh Annual Meeting, to be held in Syracuse May 11 to 14 inclusive, is planning an innovation. This will be a presentation, for the lay members and delegates of the Association, of the latest information on medical research. The talk will be given by some of the workers under the Medical Research Committee in non-technical language. It is hoped at this time to bring to the group the results of the noteworthy work which is being carried on by the Medical Research Committee.

On Tuesday night a special Christmas seal twenty-fifth anniversary dinner will be held. Miss Emily P. Bissell who originated the Christmas seal sale in 1907 will be the guest of honor at this meeting. In addition, many of the speakers will be men and women of national prominence who participated in the early days of the Christmas seal sale.

The Advisory Committee on the Christmas seal sale is planning to hold a special Christmas seal dinner on Wednesday night and will continue the Christmas seal discussions on Thursday afternoon.

A reunion of institute students is being planned and this will probably be in the form of a luncheon Tuesday.

The Clinical Section is planning for a special session on bronchiectasis and lung abscesses. Among the other general topics to be considered will be a symposium on preventorium care and a special joint session of the Clinical and Pathological Sections to consider the x-ray exhibit which will be displayed following the plan inaugurated at Memphis.

In the Pathological Section, among the subjects to be discussed in different symposiums are allergy and immunity and the various strains and characteristics of tubercle bacilli. In addition, there will be a session with miscellaneous papers.

In the Sociological Section it is planned to have one session devoted to an appraisal of the Milbank Fund Demonstration in Syracuse. The second session will be devoted to after-care. A third session will discuss industrial health service and child health education.

The program of the Administrative Section has not yet been developed sufficiently for announcement.—From the *Bulletin of the National Tuberculosis Association.*

CORRESPONDENCE

THE RECONSTRUCTION CLINIC

November 24, 1930.

Editors of the *New England Journal of Medicine.*
Gentlemen:

In the November 6 issue of the *Journal* is an article entitled "Pay Clinics," written by Mr. Wing, the Director of the Boston Dispensary.

In his concluding paragraph he regrets that the Dispensary is forced to take care of "a large proportion" of "part pay" (i.e., less than a dollar) patients in their evening clinic, but that "if treated adequately at all" these patients, until some evening free or part pay clinic is opened in Boston, must perforce be admitted at reduced rates to the evening clinic of the Dispensary.

As members of the Advisory Board of the Reconstruction Clinic may we recall your attention to the following facts, which we assume you have forgotten since the above mentioned was published without editorial comment:

1. That there is already such an evening clinic in Boston, the Reconstruction Clinic, now in its fourth year.

2. That it was established and is operated to care for precisely the group undesired by the evening clinic of the Dispensary.

3. That the Reconstruction Clinic is open Monday, Wednesday, and Friday evenings from 6:30 to 9 P. M. with a staff of thirty-seven active and consultant members.

4. That it has never let a case go untreated for inability to pay.

Respectfully,

ALICE STONE BLACKWELL,
DAVID K. NILES,
GEORGE L. PAINE.

THE DEATH OF MARTIN LUTHER—ACUTE CORONARY OCCLUSION

Mr. Editor:

The following is from "Luther's Devil," in C. MacLaurin's, "Mere Mortals," New York, 1925, George H. Doran Company.

"For two years a stone in the bladder had added to the tortures of his Ménière's disease, and on February 17, 1546, his last seizure attacked him. While at Eisleben he became very restless. 'Here at this little village I was baptized,' he said. 'It may be that I shall remain here.'

"In the evening he felt that oppression in the chest, of which he had so often complained, so he got his attendants to rub him down with hot flannels, and as soon as he felt better sat down to a light supper. In the middle of the night he awoke, feeling deadly ill.

"'O my God,' he said, 'I do feel so ill, I feel as though I were dying,' and complained of a terrible pain in his chest. His doctors found him bathed in a cold sweat and without perceptible pulse. He murmured his favorite text from St. John, 'God so loved the world that He gave his only begotten son that whosoever believeth in Him should not perish, but have everlasting life.'

"Then he became unconscious, and his friends shouted into his deaf ears the question whether he remained steadfast in his faith in Christ and his doctrine, to which they thought they heard him say 'Yes', though probably he did not hear them. At

three in the morning his breathing suddenly became audible, and, after a deep sigh, he died."

MacLaurin tells us that Luther's physicians, Hartmann and Grisar, "Attributed this obvious death from heart failure to apoplexy." MacLaurin goes on to say that "probably a certain amount of angina pectoris also entered into the picture".

The symptoms depicted in the above account would seem to leave little doubt but that acute coronary occlusion was the cause of Luther's death.

Very truly yours,

WM. PEARCE COUES, M.D.

December 2, 1930.

HOSPITAL SERVICE FOR TUBERCULOSIS PATIENTS

The Commonwealth of Massachusetts
Department of Public Health
State House, Boston

December 19, 1930.

Editor, *New England Journal of Medicine:*

May we announce through your columns that we can now accommodate reasonably promptly adults and children with non-pulmonary tuberculosis at the Lakeville State Sanatorium. Previous to last summer there was a considerable waiting list and the overturn was quite slow due to the nature of the disease. At one time it was over seven months before an applicant could be admitted. Last summer sixty beds were opened in a new building with complete resources for natural and artificial heliotherapy. Following this there were certain readjustments of beds between the adults and children within the institution and we find now that the waiting list has been completely cleared up so that, unless conditions change, reasonably prompt admission of suitable cases can be had.

In addition, I should like to point out that at the North Reading State Sanatorium we now have beds for infants and young children with tuberculosis. This type of hospital service has been notably lacking in Massachusetts and the profession generally may not know that it is now available.

Applications for both types of hospital service may be obtained by writing to the Department of Public Health at the State House or by telephoning Haymarket 4600.

Yours truly,

GEORGE H. BIGELOW, M.D.,
Commissioner of Public Health.

THE DISTRIBUTION OF TUBERCULIN AND OTHER BIOLOGICAL AND ARSENICAL PRODUCTS

The Commonwealth of Massachusetts
Department of Public Health
State House, Boston

December 19, 1930.

Editor, *New England Journal of Medicine:*

May I have the privilege of announcing through your columns that on January 1, 1931, this Department through its Antitoxin and Vaccine Laboratory will begin the distribution of standardized Old Tuberculin, Koch's "O.T." to be used for diagnostic purposes. This product will be supplied in ampoules containing approximately one and one-half cubic centimeters, and in each package there will be full directions for using this tuberculin in the Mantoux and Pirquet tests.

Because of Federal restrictions this product is for use only on human beings.

Orders for this and all other biologic and arsenical products can be mailed to the Antitoxin and Vaccine Laboratory, 375 South Street, Jamaica Plain, Massachusetts, while telephone orders can be given by calling Jamaica 5672.

For additional information concerning this product and its uses call the Director, Division of Tuberculosis, Haymarket 4600, or the Director, Division of Biologic Laboratories, Jamaica 4127 or Jamaica 5672.

This product, like all products furnished by this Department, will be distributed through local boards of health and other distributing agents as well as from the Antitoxin and Vaccine Laboratory and is given to the physicians of the Commonwealth without charge.

Yours truly,

GEORGE H. BIGELOW, M.D.,
Commissioner of Public Health.

RECENT DEATH

EMERSON—DR. NATHANIEL WALDO EMERSON, Professor Emeritus of Gynecology in Boston University School of Medicine, died at his home in the grounds of the Emerson Hospital at Forest Hills, December 20, 1930 at the age of 76. Born in Boston, March 6, 1854 he attended local schools and Bowdoin College where he received an A.B. in the class of 1880. The following year Boston University conferred the degree of M.D. upon him and he started practice in his native city. At Boston University he was successively demonstrator of anatomy, lecturer on surgery, associate professor and professor of gynecology. He was the founder of the Emerson Hospital and senior surgeon of the Trull Hospital at Biddeford, Maine. It was at the latter institution that he finished an operation, in the winter of 1906, in the midst of a fire in the building that came so close that he was forced to move his patient twice before the operation was over. Dr. Emerson was consulting surgeon to the Henry Heywood Memorial Hospital, Gardner; Wesson Memorial Hospital, Springfield; Melrose Hospital and to the Bath, Maine, City Hospital. He held membership in the Massachusetts Medical Society, the Massachusetts Homeopathic Medical Society, the American Institute of Homeopathy, the Boston Surgical and Gynecological Society and he was an honorary member of the New York Homeopathic Medical Society.

Dr. Emerson's first wife, Mrs. Anna Smith Emerson, whom he had married in 1890, died after giving birth to a son. Dr. Emerson married Miss Carlotta Adams Bond in 1905. She died less than 24 hours

before her husband, who had undergone a severe surgical operation. They are survived by two sons, both of Boston.

NEWS ITEMS

A MERITED RECOGNITION— The *Popular Science Monthly's* annual award of ten thousand dollars has been made to Dr. George H. Whipple, dean and professor of pathology of the School of Medicine and Dentistry in the University of Rochester and Dr. George R. Minot, professor of Medicine in the Medical School of Harvard University.

This sum will be divided equally between Dr. Minot and Dr. Whipple.

Dr. Whipple has been regarded as having discovered the principle of the cure and Dr. Minot the means of the application to primary anemia.

The selection of these contributors to scientific achievements of greatest benefit to humanity was made by twenty-one outstanding American scientists.

THE APPOINTMENT OF DR. JOHN M. T. FINNEY AND DR. DAVID RIESMAN—Announcement was made recently of the appointment of two new consultants of the Committee on the Costs of Medical Care—Dr. John M. T. Finney, of Baltimore, professor of clinical surgery in the medical school of Johns Hopkins University, and Dr. David Riesman, of Philadelphia, professor of clinical medicine in the medical school of the University of Pennsylvania, and physician to the Philadelphia General and University Hospitals. Dr. Finney and Dr. Riesman join Dr. Roger I. Lee, consultant in internal medicine, of Brookline, Mass., as consultants of the Committee.

Dr. Finney began the practice of medicine in Baltimore upon his graduation from Harvard in 1889. He was chief consultant in surgery for the A. E. F., and was awarded the Distinguished Service Medal. He is now a brigadier general in the Medical Reserve Corps. Dr. Riesman has practiced in Philadelphia since his graduation from the University of Pennsylvania in 1892, and has been professor of clinical medicine there since 1912. Dr. Lee, who was graduated from Harvard in 1905, was the Henry K. Oliver professor of hygiene there from 1914 to 1924 except for the two years he spent in France as consultant in medicine for the 3rd Corps, A. E. F.

NOTICES

FREE PUBLIC LECTURES AT THE HARVARD MEDICAL SCHOOL

Lectures beginning Sunday afternoon, January 4 and ending Sunday afternoon, March 29, are scheduled for the Harvard Medical School, Longwood avenue, Boston.

These are free public lectures and will be given by the faculty of medicine of Harvard. They will begin at four. No tickets are required.

The schedule of lectures follows:

January 4, Dr. R. M. Smith, Infant Mortality; January 11, Dr. S. B. Wolbach, Cancer and New Growths; January 18, Dr. J. H. Blaisdell, Fungus Diseases of the Skin; January 25, Dr. J. D. Barney, Some Causes of Bladder Trouble (to men only); February 1, Dr. R. B. Osgood, The Foot and Foot Troubles; February 8, Dr. E. P. Joslin, Diabetes: Its Control by the Individual and the State; February 15, Dr. D. H. Walker, The Conservation of Hearing; February 22, Washington's Birthday, no lecture; March 1, Dr. F. H. Cushman, Shall Our Children Have Healthy Mouths? March 8, Dr. W. H. Robey, Is Heart Disease Preventable? March 15, Dr. E. C. Schneider (Wesleyan), The Human Body: an Adaptable Machine; March 22, Dr. W. R. Ohler, The Truth About Bright's Disease; March 29, Dr. Cleaveland Floyd, Tuberculosis: Its Control and Cure.

UNITED STATES PUBLIC HEALTH SERVICE

CHANGES OF DUTIES AND STATIONS OF COMMISSIONED OFFICERS OF THE UNITED STATES PUBLIC HEALTH SERVICE IN NEW ENGLAND

December 3, 1930

Assistant Sanitary Engineer J. J. Bloomfield. Directed to proceed from New Haven, Conn., to Chelmsford, Mass., and return, in connection with field investigations of industrial hygiene. November 28, 1930.

Medical Director A. D. Foster. Directed to proceed from Boston, Mass., to Burlington, Vt., and return, for conference with physicians and medical authorities of the Universities located in said city relative to hospital matters. November 28, 1930.

DECEMBER 10, 1930

P. A. Surgeon Albert E. Russell. Directed to proceed from Washington, D. C., to West Chelmsford, Mass., New Haven, Conn., and New York City, N. Y. and return, in connection with field investigations of industrial hygiene. Dec. 3, 1930.

Sanitary Engineer Leslie C. Frank. Directed to proceed from Washington, D. C., to Worcester, Mass., and return, for the purpose of attending the annual meeting of the Massachusetts Milk Inspectors Association, on Jan. 7 and 8, 1931. Dec. 5, 1930.

Assistant Surgeon F. F. Thweatt, Jr. Relieved from duty at Ellis Island, N. Y., on Dec. 15, and assigned to duty at Marine Hospital, Vineyard Haven, Mass., in charge of the Marine Hospital.

RADIO MESSAGES

SPONSORED BY THE STATE DEPARTMENT OF PUBLIC HEALTH, COURTESY WBZA

Every Wednesday at 5:20 P. M.

December 31—"The Hospital and the Public Health", Dr. Henry M. Pollock.

A "Health Forum" directed by the State Depart-

ment of Public Health, courtesy WEEI, began October 2, 1930 and will continue Fridays at 4:50 P. M. Queries and Answers will be broadcast.

Questions on health and prevention of disease may be sent to "Forum", State Department of Public Health, State House, Boston, Mass.

MEDICAL CLINIC AT THE PETER BENT BRIGHAM HOSPITAL

At 3.30 P. M., on Thursday, January 8, in the Amphitheatre of the Peter Bent Brigham Hospital, a medical clinic will be given by Dr. Henry A. Christian, to which physicians are cordially invited.

REPORTS AND NOTICES OF MEETINGS

BERKSHIRE DISTRICT MEDICAL SOCIETY

The Berkshire District Medical Society will meet at the Wendell Hotel, Pittsfield, January 2. The speaker, Dr. Edward A. Archibald, Professor of Surgery at McGill University, Montreal, has chosen for his subject: "Surgical Treatment of Tuberculosis".

HUGH DOWNEY, *Secretary.*

MALDEN ANTI-TUBERCULOSIS SOCIETY

In calling to order the sixth semi-annual public health meeting of the Malden Anti-Tuberculosis Society in Malden High School hall on December 3, the president, Mr. John Ritchie, made note of the fact that it is one of the results of the sale of Christmas Seals. In Malden some of the pressing duties of organizations to fight tuberculosis have been assured by an enlightened school department and an active board of health, so this society has found it possible to enter seriously into the work of informing the citizens about their opportunities, hoping to create an intelligent public opinion, which must always underlie real progress in public health work. "It has been emphasized by good authorities," said the speaker, "that no health administrator, no matter how well-informed and intelligent, can long maintain real progress in his work, unless he is supported by the public opinion of his community."

The first speaker, Dr. Alton S. Pope, director of the division of tuberculosis, State Department of Public Health, credited Massachusetts with being the pioneer state in the Union in providing hospital facilities for treatment of tuberculosis. He stated that although there are 3,600 beds available in the state there is still a waiting list for Rutland. This shortage will be met, it is hoped, by the opening of the county hospitals of Middlesex and Worcester. The increasing demand for beds, according to Dr. Pope, in the face of a decreasing death rate is evidence of an important fact, namely, that the general public is becoming better educated as to the advantages of hospital treatment for this disease.

Dr. Pope emphasized the point that to make the hospitals more efficient, better facilities for diagnosis should be provided. Today fully 75 per cent. of the patients who enter hospitals come too late for favorable treatment. At least 75 per cent. should be discovered in a stage where recovery is possible. To secure such results, early diagnosis should be made. Aids to diagnosis should include the x-ray, a local trained staff and studies of contacts, home environment, etc. In order to assist in this work the county hospitals are asking authority to increase out-patient facilities and to furnish special consultation service and diagnostic clinics in rural communities. Dr. Pope presented some figures with reference to the Chadwick Clinics, the value of which is the discovery of early infection and the application of measures to prevent the development of the adult type.

In his address on "What the Malden Public Schools do for the Health of the Pupils," Superintendent of Schools, Mr. Farnsworth G. Marshall, explained three principal topics. The first was an evaluation of the Christmas Seal as a health agency, the second was with reference to health education in the schools and the third was the need of a new high school. The Malden school program includes regular periods for inspection and the study of health principles. In this work Malden has been a leader, and the system established by it has been the pattern for similar educational work in Western cities. Some reference was made to proper planning of a modern school building, giving adequate floor space, heating, ventilation and illumination, and some of the needs for special rooms for gymnasium, sewing, cooking, drawing and industrial courses, all of which are related to the conservation of the health of pupils and teachers.

An outline of the practical work of the school nurse, presented by Mrs. Sarah C. Hayford, R.N., superintendent of school nurses in Malden, supplemented this address. The text of the story was a quotation from a paper by John A. Cousens, LL.D., president of Tufts College, "The school should first of all furnish the essential tools with which to meet the problems of life," most important being the application of knowledge of the rules of health. It is the function of the nurse to care for the health of her charges involving constant supervision.

The old idea of underweight, which has had its place in the development of health procedure, is giving way now to a study of gain in weight, which is likely to be variable for different children. Weighing once a month is the practice in the Malden schools, and the parents of the child found to be losing weight or stationary are advised to seek professional advice.

When children enter Grade I, the nurses aid the school physicians in their examinations, and make efforts to have the parents present, for conference with the doctors. All defects are recorded and reported to the home, this being followed by house calls and conferences with the parents by the nurse. Some of the details of regular work for which the nurses assemble and prepare the children include examination of heads, skin, teeth and throats, re-

testing of eyes, hearing tests with the audion, Schick tests and immunization, and reëxamination of children suspected of being possible subjects for tuberculosis as a feature of the State ten-year program. The nurses assemble and accompany the children to the various clinics. In cases where it is found that there is need of pecuniary assistance, the nurse presents the facts to the proper clinic or agency.

The follow-up schedule on children of the ten-year program has been very satisfactory and the number remaining "suspicious" is growing less each year. The procedure is to assemble the children at the dispensary for tests of temperature, weight and if necessary the von Pirquet. On discovery of a communicable disease in a classroom, inspection of the pupils follows. There is an examination for evidence of vaccination made of all children on entrance and sick absentees are followed up. An absence of three days calls for a physician's certificate before admission of the child. Efforts are made to secure preschool examinations of prospective pupils. "Much of this work," said Mrs. Hayford in closing, "is in conformity with the modern health idea of prevention."

The last speaker at the meeting was Dr. C. C. Burpee, chairman of the Malden Board of Health, who briefly reviewed the work of the department, making special reference to the tuberculosis hospital recently established by his board.

For a final feature a motion picture, "New Ways for Old," one of the series prepared by the Metropolitan Life Insurance Co., sketched the advance in treatment of diphtheria from Civil War to the present time.

THE ANNUAL MEETING OF THE MASSACHUSETTS ASSOCIATION OF DIRECTORS OF PUBLIC HEALTH NURSING ORGANIZATIONS

The Massachusetts Association of Directors of Public Health Nursing Organizations held its annual meeting December 3, 1930 at the rooms of the Y. W. C. A.

Professor C.-E. A. Winslow of the Yale University Department of Public Health delivered an address in which was incorporated the prophecy that within the next generation public health nurses would be serving the entire community with the result that the state would be better served with public health service than now.

It was voted that the Organization be disbanded and a new Association be formed under the designation of the Massachusetts Organization for Public Health Nursing. Membership in the new body will be composed of board members and directors of nursing organizations and the nurses.

The following named officers were elected: President, Miss Gertrude W. Peabody of Cambridge; Vice-Presidents, Miss Katherine Pierce and Mrs. James W. Russell; Secretary, Mrs. Harold A. Marvin; Treasurer, Miss Marie Knowles; Directors, Miss Sophie Nelson, Miss Florence Patterson, Miss Margaret Riley, Miss Eleanor Lovett and Mrs. William A. Muller.

HARVARD MEDICAL SOCIETY

Dr. Cecil Drinker presided at the meeting of the Harvard Medical Society held at the Peter Bent Brigham Hospital on Tuesday, December 9.

Dr. Mahoney presented the first case from the surgical service. The patient, a 38 year old, single, Chinese laundry worker was admitted complaining of intermittent pains in the left upper abdominal quadrant for twenty years. He was born in and has always lived in the United States. The pain had gradually grown more severe with rare remissions. Ten years ago he noticed a fullness in the left upper quadrant. He also noticed some frequency and nocturia. During the past year he has grown weaker and for the past two weeks has had chills and fever. There has been no loss of weight. Physical examination showed a somewhat cachectic person with a fullness in the left flank. Palpation revealed two masses. One was in the epigastrium just to the left of the costo-chrondral junction. The other extended from the left costal margin to four centimeters above the symphysis pubis and showed a definite notch at the umbilicus. It was not soft or tender and did not move with respiration. The urine was negative. Blood examination showed a red count of 2,500,000 and a white count of 3000. The smear was normal. A flat plate of the abdomen showed a shadow in the left flank and stones in the gall bladder. At operation the spleen and gallbladder were removed. The liver was normal. On the second day following operation the red count was 4,000,000, and the white count was 15,000. On the fourteenth day after operation the red and white cell counts were normal.

The spleen weighed 2300 grams and examination of a section showed hyperplasia. A biopsy of the liver showed it to be normal.

The case was presented for discussion. Dr. Wm. P. Murphy said that the history as presented together with enlargement of the spleen and involvement of the gall bladder was suggestive of a hemolytic icterus probably dating back many years. The absence of jaundice, however, favored a diagnosis of Banti's disease.

The medical case was presented by Dr. Pokorny. The patient was a sixty-nine year old, American baker. For the past twelve or fifteen years he has had occasional aches in his legs which were relieved by massage. He had also noticed a slow progressive bowing of the legs. Four years ago he had a sore throat, accompanied by chills and fever. He required four weeks to convalesce and felt very weak for the next six months. One and a half years ago he began to get dyspneic. This has continued to the present. Two weeks ago he was given digitalis at the Boston Dispensary and three chest taps were done. There was no improvement. Examination of the fundi showed moderate sclerosis. The chest was of barrel type. There were moist râles at both bases and signs of fluid at the right base. The apex impulse was in the anterior axillary line and a palpable thrill was present. There was a coarse systolic murmur over the base and to the left of the sternum. The second sound was fol-

lowed by a distant third sound with a soft murmur early in diastole. The pulse rate was sixty and totally irregular. There was marked peripheral sclerosis and the blood pressure was 135/55. The liver was felt two finger breadths down. There was no ascites or edema. Examination of lower extremities showed a marked bowing of both legs and an increase in local temperature over both tibia. There was a moderate secondary anaemia. Two chest taps were done and a clear yellow fluid, with a specific gravity of 10.10, was obtained.

X-ray examination showed the changes typical of Paget's disease. Electrocardiographic tracings confirmed the diagnosis of a slow fibrillation.

Following the presentation of cases Dr. Walter B. Cannon, Professor of Physiology, Harvard Medical School, addressed the meeting on "The Explanation of a Mysterious Emotional Increase of Heart Rate."

The mystery of the problem was relative to observations made upon a denervated heart used as a means of indicating changes in the blood stream. Such a heart, from which the vagus and acceleration influences have been removed, is connected with the body only through the blood stream. From previous studies it is known that the heart shows a rapid acceleration following the injection of a very minute amount of adrenalin, or emotional stimulation of adrenal secretion. However, it was found, when the adrenals had been removed and the liver disconnected from the central nervous system, that, while the rapid acceleration of the pulse following emotion disappeared, it was followed by a slow rise. This slow rise took place over a period of two or three minutes, amounted to twenty-seven beats and then was slowly recovered from. In the normal animal this slow rise is masked. This slow rise in pulse following emotional stimulation in an animal whose heart was denervated and in which the effect of the adrenal glands were removed, constituted the mystery which Dr. Cannon and his associates determined to solve.

In attempting to explain this phenomenon it was assumed that the cause must be carried to the heart through the blood stream. The possibilities that it might be due to a rise in blood pressure subsequent to excitement or to an increase in temperature following muscular effort were ruled out. Then in a series of experiments each organ of the abdomen was ruled out as a possible cause. These included the medulla in the denervated adrenal gland, the accessory adrenals on the surface of the aorta, the adrenalin in the adrenal cortex, and a cardio accelerator substance in the liver. In further experiments the thyroid, parathyroid and pituitary glands were removed and still the increase in heart rate took place. The possibility of metabolites from active skeletal muscles was then considered but they were found to have no effect.

With the mystery still unsolved it was decided to try and determine which end of the animal was involved in the cause of the mystery. The spinal cord was severed at the level of the seventh thoracic and upon excitement to the front end of the animal there was no increase in heart rate. Concluding that their experiments must be confined to the rear end of the animal the workers stimulated the abdominal sympathetics and the pulse rate went up as before. After complete removal of the sympathetic chain there was no rise. It was found, however, that stimulation of the tail of the animal led to an erection of the tail hairs and to the mysterious rise in pulse, and that when the blood supply to the tail was shut off the rise did not occur until the obstruction to blood flow was removed. Since the only structures still remaining innervated by the sympathetics, were the smooth muscles it was concluded that stimulation of smooth muscle led to and caused an acceleration of heart rate. This substance coming from smooth muscle when influenced by sympathetic impulses acts in a typical and useful way and has all the characteristics of a hormone. It was called, provisionally, sympathin. Sympathin and adrenin act in a similar manner but the action of sympathin is much slower.

Dr. John Flynn of the Peter Bent Brigham Hospital gave a short discussion of the rôle of sulphur in metabolism. He gave a brief review of the chemistry of sulphur in the body and then discussed the result of the treatment of alopecia areata with sulphur. For a series of seven cases there was a growth of a certain amount of hair in five. He also pointed out that patients who had a large tolerance for thyroid substance showed a marked decrease in this tolerance following the administration of sulphur. This suggests that in patients with myxedema there is a synergistic action between sulphur and thyroid substance.

M. M. S. 150TH YEAR: E. N. D. M. S. 90th YEAR WEDNESDAY, JANUARY 7, 1931

In ye vestry of ye Groveland Congregational Church, where ye first meetings of ye society were held ninety years ago.

Groveland was the home of Jeremiah Spofford, our first president. Early documents pertaining to the Society, antiquated instruments, etc., will be on exhibit. (If you have anything of historical medical interest, please bring it along.)

Chicken pie dinner at 12.30. (Smokes provided.) Followed by business meeting.

2.00. The History of Medicine at the Mouth of the Merrimack River.—F. W. Snow, M.D., of Newburyport.

2.20. 1836-1930 Medical Practice in Haverhill and Vicinity, based on 100 years' records and 50 years' recollection.—F. W. Anthony, M.D., of Haverhill.

2.40. The Story of Essex North District in Lawrence, Methuen, Andover and North Andover, from 1841 to 1930.—J. Forrest Burnham, M.D., of Lawrence.

3.00. Reminiscences by everyone.

Groveland is two and one-half miles from Haverhill center. Follow the river; after crossing the Groveland Bridge, turn left with the trolley. The vestry faces the small park at the second street on the right.

Telephone Haverhill 598-W.

JOHN E. BRYANT, M.D., *Pres.*
E. S. BAGNALL, M.D., *Sec.*,
281 Main St., Groveland.

CONFERENCE ON MENTAL HYGIENE IN INDUSTRY

To be held by coöperation of the Massachusetts Society for Mental Hygiene and the Personnel Research Federation

Boston

Thursday, January 22, 1931

MORNING SESSION: Twentieth Century Club, 3 Joy Street, 10:00 A. M.

Chairman: Dr. L. J. O'Rourke, President, Personnel Research Federation

Subject: *Picking the Worker*

Speakers:

1. Dr. Marion A. Bills
   Assistant Secretary, Aetna Life Insurance Co., Hartford.
2. V. V. Anderson, M.D.
   Director of Employment, Placement and Personnel Research, R. H. Macy & Co., New York City.
3. Mr. John A. Garvey
   Personnel Manager, Dennison Manufacturing Co., Framingham.

Discussion.

INFORMAL LUNCHEON: Twentieth Century Club. 12:30 P. M.

AFTERNOON SESSION: Twentieth Century Club. 2:00 P. M.

Chairman: Hon. Herbert C. Parsons, President, Massachusetts Society for Mental Hygiene.

Subject: *Fitting the Worker to the Job*

Speakers:

1. Mr. J. E. Goss
   Director of Apprentices, Brown & Sharpe Mfg. Co., Providence.
2. Mr. L. C. McKenney
   Employment Manager, Hood Rubber Company, Watertown.
3. Dr. C. S. Slocombe
   Safety Adviser, Boston Elevated Railway Company.

Discussion.

DINNER AND EVENING SESSION: Hotel Statler, 6:30 P. M.

Chairman: Mr. Edward Dana, General Manager, Boston Elevated Railway Company.

Subject: *Keeping the Worker on the Job*

Speakers:

1. Dr. H. S. Person
   Managing Director, Taylor Society, New York City.
2. Prof. Elton Mayo
   Division of Industrial Research, Harvard Graduate School of Business Administration.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

There will be a meeting of the Middlesex East District Medical Society at the Harvard Club of Boston on Wednesday, January 21, 1931. Dinner will be served at 6:30 P. M.

Speaker: Dr. George Gilbert Smith.

Subject: The Etiology, Prevention and Treatment of Prostatic Diseases.

A. R. CUNNINGHAM, *Secretary.*

SOCIETY MEETINGS

CONGRESSES AND CONFERENCES

January 4-March 28—Harvard Medical School. Free Public Lectures. See page 1312.

January 7—Cardiac Course. See page 854, issue of October 23.

January 8—Medical Clinic at Peter Bent Brigham Hospital. See page 1313.

January 22—Conference on Mental Hygiene in Industry. See details elsewhere on this page.

March 23-27, 1931—Fifteenth annual clinical session of the American College of Physicians. Detailed notice appears on page 760, issue of April 17.

May 11-14—Meeting of the National Tuberculosis Association at Syracuse. See page 1310.

July 27-31, 1931—Third International Congress of Radiology, Paris. Complete notice appears on page 236, issue of August 21.

DISTRICT MEDICAL SOCIETIES

Berkshire District Medical Society

January 2—See page 1313.

Bristol North District Medical Society

April 16, 1931—Taunton Woman's Club.
September 17, 1931.

Essex North District Medical Society

January 7—See page 1315.

Essex South District Medical Society

Wednesday, January 7, 1931—Beverly Hospital. Clinic 5 P. M. Dinner 7 P. M. Symposium on Duodenal Ulcer. Speakers: Dr. Franklin White, Medical Aspect. Dr. A. W. George, X-ray Aspect. Dr. P. P. Johnson, Surgical Aspect.

Wednesday, February 4, 1931—Council meeting, Boston.

Wednesday, February 11, 1931—Danvers State Hospital. Clinic at 5 P. M. Dinner 7 P. M. Speaker: Dr. Bryant E. Moulton, Assistant Director of the Judge Baker Foundation. Subject: "Juvenile Delinquency."

Wednesday, March 4, 1931—Lynn Hospital. Clinic at 5 P. M. Dinner at 7 P. M. Speaker: Dr. Arthur Allen, of Boston. Subject: "Neurovascular Surgery, including injections for varicose ulcer."

Thursday, May 7, 1931—Censors meet at Salem Hospital at 3:30 P. M.

Tuesday, May 12, 1931—Annual Meeting. The Tavern, Gloucester. Speaker: Dr. Morris Fishbein, Editor of the A. M. A. Journal of Chicago. Subject: "History of Medical Cults." Ladies invited.

Franklin District Medical Society

January, 1931-May, 1931—The meetings are held on the second Tuesdays of January, March and May at 11 A. M. at the Weldon Hotel, Greenfield.

Middlesex East District Medical Society

January 21—See notice elsewhere on this page.
March 11, 1931—At Reading.
May 13, 1931—At Wakefield.

Norfolk South District Medical Society

The meetings for the ensuing year are as follows:
January 8, 1931, February 5, 1931, March 5, 1931, April 2, 1931, May 7, 1931.

All meetings begin at 12 noon. The February meeting will be held at the Quincy City Hospital. All other meetings will be held at the Norfolk County Hospital, South Braintree.

The censors will meet on May 7 at 11:30 A. M. at the Norfolk County Hospital, South Braintree.

NATHAN R. PILLSBURY, Secretary.

Suffolk District Medical Society

January 23-April 29—Combined meetings with the Boston Medical Library. These meetings will be held as specified below on Wednesdays, at 8:15 P. M.

January 28, 1931—General meeting in association with the Boston Medical Library at the Boston Medical Library. "The Practice of Medicine in Relation to Public Health Activities." Speakers to be announced later.

February 25, 1931—Clinical Program, Boston City Hospital.

March 25, 1931—Clinical Program, Beth Israel Hospital.

April 29, 1931—Annual Meeting. Election of Officers. Boston Medical Library.

The medical profession is cordially invited to attend all of these meetings.

GEORGE S. DERBY, M.D.,
President, Suffolk District Medical Society.

LELAND S. McKITTRICK, M.D.,
Secretary, Suffolk District Medical Society.

HILBERT P. DAY, M.D.,
Boston Medical Library.

BOOK REVIEWS

Burns. Types, Pathology and Management. By GEORGE T. PACK and A. HOBSON DAVIS. J. B. Lippincott Company. Price $6.00.

The book is divided into three parts. Part One deals with fundamental facts concerning burns and scalds including classification, changes of local char-

acter, of general tissues, and of blood and urine, poisoning products, symptoms, diagnosis, complications, prognosis and causes of death. It is startling to read that 45% of deaths from burns occur in the first five years of life and that carelessness of parents and servants is largely responsible (inordinately hot baths in the treatment of asphyxia neonatorum and convulsions, spilling of hot liquids, etc.). Burns stand fourth in accidental deaths being exceeded only by automobile fatalities, falls and drownings. Berkow's method of estimating the involved surface area is detailed. The skin pathology is described. Under general tissue changes we read the adrenals may increase four times in weight with early excess and later diminution in epinephrine output. The spleen is enlarged and softened with areas of focal necrosis and shows an early increase in phagocytic endothelial leucocytes. The various theories regarding the production of duodenal ulcers are considered at length. The consensus of opinion favors toxin absorption. The first symptoms, hemorrhage and localized tenderness, may appear in one or two weeks but death from this cause may be as late as eight weeks. High blood concentration is associated with low pulse pressure and is due to loss of blood plasma and partial paresis of the vasomotor system leading to one to four million increase per cu. mm. in red cell count. There is a predisposition to thrombosis and the coagulation time may be reduced to two minutes. Almost without exception the sodium chloride blood content varies inversely with hemoglobin value. Urinary chlorides are almost completely suppressed until separation of devitalized tissue at site of burn. The fall of blood chlorides is not wholly explained by alteration of renal threshold, diet, fever, exhaustion, blood concentration or by vomiting but there is suggestive evidence of a sodium chloride retention. The consideration of twenty-four explanations of the toxaemia shows that the toxin of the burns is unknown. Similarities to typhoid fever in pathology and symptoms are noted in several places. In prognosis the extent of the burn is of more importance than its depth.

Part Two deals with the management of Thermal Burns. The Chapters are devoted to prevention; immediate local and systemic treatment; wet dressings, immersion; light, open-air and occlusive dressing treatment; épluchage; granulation tissue care; skin grafting; diseases of cicatrices and deformities.

It is appalling to read that a survey of fatalities from burns shows that in 90% the burns were due to gross carelessness. Protective measures are considered (fireproof building, ready exits, external fire escapes, fire drills in all structures which house large numbers, educating children regarding the danger of fire, making all burns notifiable accidents, the treatment of theatrical scenery and draperies of pageants with Pabst's mixture of ammonium chloride). The administration of tetanus antitoxin in all considerable burns is advocated. No one procedure as a local measure, as an operative intervention, or as a method of skin grafting will prove equally valuable for all cases and all stages of burns. The indications for treatment are the relief of pain and shock; measures to guard against complications including exhaustion, to promote healing and to restore function. The desiderata of a dressing are comfort, non-adherence, non-toxicity, promotion of healing, and non-interference with epidermatization. These various points are rationally presented.

Intravenous saline solution is of value not only as a diluent and diuretic but in adding sodium chloride to the blood. Intravenous glucose solution acts as a diluting fluid and a diuretic, furnishes nourishment, prevents and alleviates acidosis, and relieves toxaemia. The Thalhimer method of intravenous glucose solution with insulin is described. The authors prefer these methods of treatment to exsanguination-transfusion. When blood transfusion is indicated whole blood rather than citrated blood should be used, since sodium citrate intravenously increases the coagulability of the blood. Although this action is desirable in certain hemorrhagic diseases, it is undesirable in conditions in which intravascular clotting or thrombosis of small vessels throughout the viscera occurs, as in severe burns. The authors regard the tannic acid treatment as one of the most important contributions to burn therapy during the twentieth century. They believe the use of picric acid should be limited to emergency treatment of severe burns and scalds. The application of paraffin as an occlusive dressing, its advantages and indications, and its disadvantages and contraindications are rationally presented.

Part Three is a consideration of Regional Burns and Burns by Specific Agents (electricity, lightning, roentgen lamps, radium, the sun, caustic chemicals, and war gases). The final chapter deals with the medico-legal aspects of burns and scalds.

Although this is a relatively small volume (350 pages of text with 60 illustrations), it is so tersely written that all phases of the subject are excellently covered. It contains not only the experience of the authors but also 510 references to the literature by 473 authors. The references to original sources on animal experimentation and other methods of research indicate the thoroughness of the study and give the reader a feeling of security and confidence.

In a severe burn a large skin area is suddenly destroyed. The immediate shock is soon followed by grave biochemical phenomena due to toxic absorption. The management of a case is a great responsibility and requires a knowledge of effective measures to relieve the shock, to combat the toxaemia, and to deal with the burned area. The multiplicity of the measures which have been advocated in the last two decades alone led to much confusion in the minds of thinking practitioners. To them this volume should be particularly welcome; for herein is rationally evaluated a vast amount of literature by two experienced men. They give their opinions without bias. Their reasoning they tersely give. This is their method in presenting the management of acute (early) cases, which, to the reviewer, is the most valuable part for the general

practitioner. The book should find a place in every hospital library, on the shelves those who undertake the treatment of burns and should be of value to all those who teach this subject.

Trauma, Disease, Compensation. A Handbook of Their Medico-Legal Relations. By Dr. A. J. Fraser, Chief Medical Officer, Workmen's Compensation Board, Winnipeg. Philadelphia, F. A. Davis Co., Publishers, 1930. Price $6.50.

This is one more book of great "assistance" in the very difficult task of diagnosis and the equally complicated problem of the determination of liability, and is welcome indeed.

It is a book that is at its best in describing the results of well-known facts of distinct trauma and follows well considered pathological views.

The chapters defining "accident, trauma and disease", and defining "arising out of the employment", are well written, with profuse references.

Chapters on antecedent disease, impairment and incapacity for work, are also well considered, and it is evident that the Manitoba Board has made an excellent attempt to measure results of medical injuries. The desire of compensation boards to solve moot medical questions by fiat, is prominent throughout the work and some of the decisions quoted are settled by "the influence of his injury as the exciting cause not denied by the medical attendants".

The cases quoted under hernia, are not described in such a way as to be conclusive, although the conditions are described in such a way as to be valuable for quick reference.

Under the chapter of brain tumors, statements are attributed to Wilson (S. A. K.), who calls attention to the thousands of cases of head injury resulting from the recent great war and among the large number of cases seen by him during the period of nine years, he states he had never seen a case of brain tumor. He pronounces as unjustified and obsolete, the "theory that trauma may originate brain tumors".

The chapter on "pneumoconiosis" is well worth reading, as the present tendency of "chest men" is to call the condition when diagnosed, a disability, no matter if the man by all working standards is still working and able to continue.

Appendicitis, arising from trauma, is still not proven by the case used for illustration (page 185):

"J. C., age 24, yardman in an abattoir. He was kicked by a steer in the right lower region of the abdomen on October 15, 1926. He felt a stinging pain in the abdomen lasting for a few minutes but was able to work. He returned to work the next morning, then was home for two days, having some abdominal pain. Then he worked without pain until January 16, 1927. On February 26, appendectomy was done and the appendix reported to be definitely pathological. Held that the condition of disability arose by accident out of and in the course of his employment."

We hardly believe that medical opinion in this community at least, would acquiesce in this decision from such an accident.

Under retroversion (page 208):

"Single bindery worker, age 22. On August 13, 1924, in the course of her employment, carrying a bundle of papers weighing 40 pounds, when she stumbled and fell on her knees. Stinging pain low in the abdomen, but kept on working for half an hour, fainted and taken home. After ten days she returned to work. Six and one-half months later, examined by a gynecologist; showed normal pelvic organs, hymen intact, and no sign of pelvic disease, with the uterus in retroversion, and mobility limited by tenderness. Held that the claimant had suffered personal injury arising out of and in the course of her employment."

This case is open to the objection that falling forward on her hands and knees would certainly not be a position that would cause any retro position of the uterus or would aggravate one if it already existed.

The word "trauma" throughout the book, is used in the usual loose method, although in cancer of the gastro-intestinal tract, in quoting Segond, the author is back on safe ground.

The thorough review of the literature upon cases that may be claimed as arising out of and in the course of the employment, makes the book well worth while, and the bibliography quoted at the end of each chapter, makes the book particularly valuable for quick reference.

Our New Progress. By James Bayard Clark. G. P. Putnam's Sons, New York. Price $2.00.

Since societies became organized there have been at least two classes in them, the rulers and the ruled. This social inequality had its origin in the results of war, the surviving vanquished being taken into slavery. The persistence of slavery for untold generations has produced in the lower, if a middle class developed, in the lowest group, a servile mentality, which is still present today and is the underlying basis for our social ill health. Social service is a remedy devised by the ruling class, ostensibly to relieve the social illness, but it is a cunning and effective procedure for still further increasing the servile mentality and as such is supported by the rich. Charity as now practiced exaggerates the evil it would seem to relieve, by undermining and destroying what is left of the self-sufficiency tendency of the individual. Even the teaching and the medical professions, the last strongholds of individualism have been subverted, or are in process of subversion, by the Foundations, official charity dispensers of the slaveholding class.

Substantially, these essays point out that our prosperity is not pure gold, that our charity may be doing much harm, and that the gifts by the Foundations have had some unexpected and undesirable results.

The arguments presented by Dr. Clark are not convincing. Apparently he holds the doctrine so vehemently set forth by Rousseau that the state of na-

ture is the state of freedom. Since the days of the French Revolution support of this dogma has been weakening, in spite of a kind of recrudescence in the Russian Revolution, and there has been increasing agreement with Action: "Liberty . . . is the delicate fruit of a mature civilization."

The biological argument concerning the hereditary quality of servile mentality is impaired by the author's concession that the slavery system was very wasteful of human life and the slave owners found it cheaper, often, to make new slaves by capture, rather than by breeding from those already in their possession. The question of the inheritability of acquired servile mentality is regarded as solved and concerning this the author has no doubts. Most biologists will hesitate to accept Dr. Clark's solution.

The value of the book, and it has a distinct value, lies not in the argument, which is far from cogent, but in the mere fact that the author challenges us to scrutinize our prosperity and our charity, which he says have a common root, and see if they be real, which he says they are not.

It is an incontrovertible dictum that absolute power corrupts the heart of man. The needed salt, the preservative, is control of power, social control, so that the self-sufficiency tendency of the individual may have free play, the author would say may regain its pristine and primitive freedom. Social inequality must be destroyed by destroying the servile mentality.

Dr. Clark does not claim to solve this problem: he merely states it. In the process of solution, the first step is to formulate the problem correctly. Does Dr. Clark take this step? The reader is referred to Dr. Clark's book.

The Surgical Clinics of North America. Pacific Coast Number. October, 1930. W. B. Saunders Co., Philadelphia.

This issue is composed of contributions by fellows of the Pacific Coast Surgical Association. It opens with the report of a case of traumatic emphysema by Rexwald Brown. Following a fracture of three ribs, subcutaneous emphysema developed extending from the head to the feet. Incisions were made down to the fractured ribs and negative pressure was produced in the pleural cavity. The patient recovered. He also describes a case of traumatic myositis abdominalis giving the picture of a surgical belly several months after a bruise. This became infected and was followed by a subphrenic abscess.

W. C. Chidester presents a case of high intestinal obstruction due to a constricting band of omentum in which the history suggested ruptured peptic ulcer or acute pancreatitis.

An unusual gall bladder is described by F. K. Collins. It was about the size and shape of a football and contained over 2,000 c.c. of fluid as well as a large number of stones.

L. Eloesser illustrates the closure of bronchial fistula by nine case reports. The technic varies with each case but in general consists of freeing the involved lung, radical excision of the fistulous tract, and closure by suture. A complete lobectomy is often required.

E. F. Holman gives a most interesting account of the treatment of persistent parotid fistulae by avulsion of the auriculotemporal nerve. Stimulation of the auriculotemporal nerve, the cerebrospinal nerve supply of the parotid, causes a profuse watery secretion; while the action of the sympathetic fibers apparently allows only a very scanty thick secretion. Two cases are reported where persistent parotid fistulae were cured by avulsion of the auriculotemporal nerve through an incision in front of the ear.

From Honolulu, J. R. Judd presents three unusual manifestations of infection of the lymphatics. The first developed such swelling of the scrotum that its weight almost equalled that of the patient. The next was a large inflammatory tumor of the sigmoid presumably due to infection carried from the anal region by the lymphatics. The third was a metastatic subhepatic abscess subsequent to an ischiorectal abscess.

A bronchobiliary fistula following a penetrating wound is reported by A. O. and R. H. Loe. A fistulous tract connecting the lung and the liver was opened and the chest drained with complete recovery.

A. J. Scholl describes three cases of carcinoma of the kidney, atypical in type.

An excellent discussion of fractures of the spine is given by W. A. Taylor. He emphasizes the value of x-ray in every suspicious case. The usual treatment is the use of a convex Bradford frame with extension and counterextension.

R. E. Watkins presents the subject of prolapse of the uterus in elderly women. For the extreme cases he advises the Mayo type vaginal hysterectomy with excision of the accompanying enterocele. The technic is clearly outlined.

These with several other interesting clinics make this contribution from the Pacific Coast of both interest and value to the surgeon.

A Text-Book of Gynecology. By ARTHUR HALE CURTIS, M.D., Professor and Head of the Department of Obstetrics & Gynecology, Northwestern University Medical School; Chief of the Gynecological Service, Passavant Memorial Hospital, Chicago. 380 pages with 222 original illustrations. Philadelphia and London; W. B. Saunders Co., 1930. Cloth $5.00.

In his preface the author states that it is his purpose in the publication of his book "to present the specialty of Gynecology in concise form and in an entirely independent manner". It is that purpose, one which has been abundantly accomplished, which makes this work so valuable alike to students of the subject and to fellow specialists. This is a book which should be part of the equipment of every physician whose practice deals with either Obstetrics or Gynecology. It is also a useful textbook for the student particularly as it consistently presents the views of one man, and is thus free from any ambiguity of presentation. An excellent bibliography gives the student an easy opportunity to consult other au-

thorities on controversial subjects. The illustrations alone with which the book is liberally supplied add greatly to its value. Those dealing with pathology and the different stages of the suggested operative procedures are especially worth while. The text is written simply and cannot be too highly commended for its brevity. This is the result of conciseness and not from superficial treatment of any of the problems.

The following sectional headings give an approximate idea as to the general method of approach:

Section I. Infectious processes. Section II. Tumors of the uterus. Section III. Tumors of the ovary. Section IV. Displacements and relaxations. Section V. Disturbances of function. Sections VI., VII. and VIII. Special diseases and topics connected with Gynecology.

Taken altogether the book is an adequate though brief presentation of a most complex subject. The author is to be congratulated on what he has accomplished.

Les Plexus Choroïdes. By D. NATHALIE ZAND. Masson & Cie, Libraires de L'Academie de Medecine, 120, Boulevard Saint-Germain, Paris, 1930. Price 22 fr.

This monograph presents to the reader in a clear and concise way Mme. Zand's conception of the choroid plexus. It is no mere gathering together of the literature pertaining to this interesting and sometimes misunderstood structure. The author is an investigator in her own right and she does not hesitate to pit her own opinions against those of other investigators.

She has set forth her subject in three major headings:—anatomy, physiology and pathology. In all three the subject is well covered and wherever a difference of opinion exists among the various investigators, both sides of the question are clearly given. She then proceeds to analyze these varying hypotheses and states her own opinions as to the merits of the discussion giving her reasons gathered from her own experience.

In the section on pathology we find a short description of the changes found in the choroid plexus in various diseases. These descriptions are short and direct. They form a very valuable part of this excellent addition to the literature of a difficult and little understood subject.

Hypertension. By LESLIE T. GAGER. Williams and Wilkins Company. Price $3.00.

This is a 150-page, well-written, very readable book which considers "high blood pressure as a primary disorder of vasomotor function". A bibliography of over 500 references is included. The chapter on the relationship of hypertension to renal disease should be read by every practitioner of medicine. In addition, there are unusually excellent chapters concerning the functional basis of hypertension and the chemical factors involved. The physician who feels that nothing can be done about hypertension will receive new inspiration by reading the chapter on "Treatment." The author sums up all the data at present available about the various methods of treatment, organized definite régimes with illustrative cases and surprises us with the happy results obtained. He takes a much more hopeful attitude than we are accustomed to adopt and points out that in the treatment of hypertension "the physician learns full appreciation of his limitations, and yet opportunities 'sometimes to cure, often to relieve, always to console' ".

The book has real, practical value and will also be of service to the research worker.

BOOKS RECEIVED FOR REVIEW

Introduction to Medical Biometry and Statistics by Raymond Pearl. Second Edition. Published by W. B. Saunders Company. 459 Pages. Price $5.50.

A Primer for Diabetic Patients by Russell M. Wilder. Fourth Edition. Published by W. B. Saunders Company. 138 Pages. Price $1.50.

Physical Diagnosis by Warren P. Elmer and W. D. Rose. Sixth Edition. Published by The C. V. Mosby Company. 903 Pages. Price $10.00.

Medical Jurisprudence by Elmer D. Brothers. Third Edition. Published by The C. V. Mosby Company. 309 Pages. Price $3.50.

A Manual of Normal Physical Signs by Wyndham B. Blanton. Second Edition. Published by The C. V. Mosby Company. 246 Pages. Price $3.00.

Operative Gynecology by Harry Sturgeon Crossen and Robert James Crossen. Fourth Edition. Published by The C. V. Mosby Company. 1078 Pages. Price $15.00.

Techniques Courantes de Chimie Clinique by W. Mestrezat. Published by Masson et Cie, Éditeurs. 264 Pages. Price 32 fr.

Actualités Médico-Chirurgicales by the Chiefs of the Clinic, of the Faculty of Medicine of Marseille. Published by Masson et Cie, Éditeurs. 344 Pages. Price 35 fr.

Chronic Arthritis and Rheumatoid Affections with Recovery Record by Bernard Langdon Wyatt. Published by William Wood and Company. 166 Pages. Price $2.50.

Die Chirurgie by Prof. Dr. M. Kirschner and Prof. Dr. O. Nordmann. Lieferung 30. Published by Urban & Schwarzenberg.

Nosography—The Evolution of Clinical Medicine in Modern Times by Knud Faber. Second Edition. Published by Paul B. Hoeber, Inc. 222 Pages. Price $3.75.

Microbiology and Elementary Pathology for the Use of Nurses by Charles G. Sinclair. Published by F. A. Davis Company. 362 Pages. Price $2 50.

Therapeutic Uses of Infra-Red Rays by W. Annandale Troup. Published by the Actinic Press Ltd. 57 Pages. Price $1.50.

Piersol's Human Anatomy. Ninth Edition Revised under the supervision of G. Carl Huber. Published by J. B. Lippincott Company. 2104 Pages. Price $10.00.